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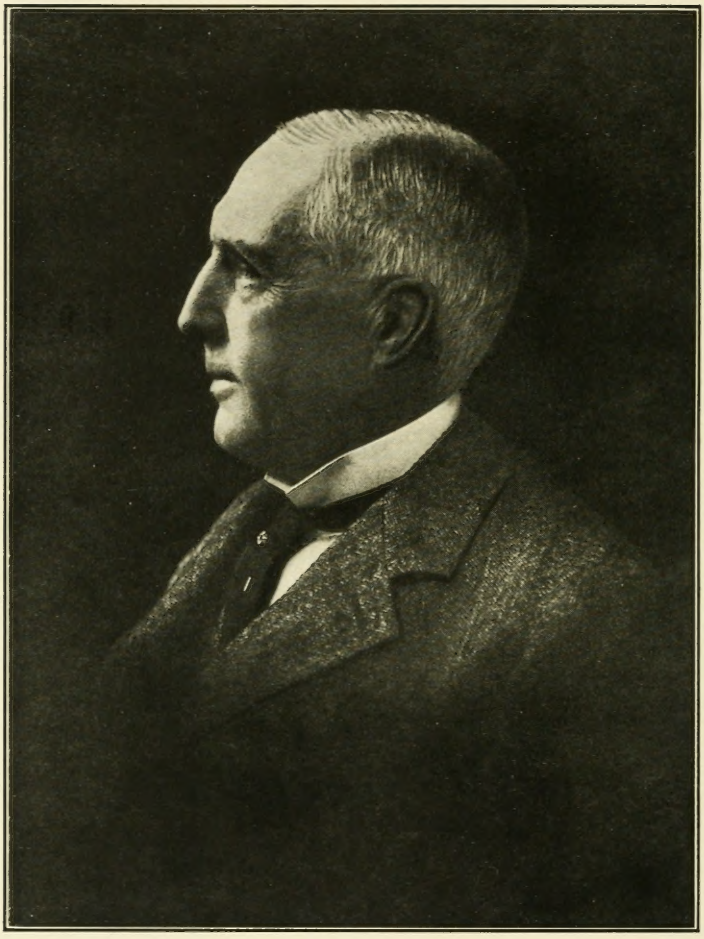

DR. FREDERICK DUCANE GODMAN.

FOUNDER AND EDITOR OF THE 'BIOLOGIA CENTRALI-AMERICANA.'

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXVII. MAY, 1916. No. 5.

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The Completion of a Great Work.

(Plates X, XI.)

In the News for November, 1915, page 422, the appearance of the Introductory (and final) volume of the *Biologia Centrali-Americana** was announced in a quotation from *The Times Literary Supplement* of London and we then expressed the hope of presenting a more extended notice of the Introduction at a later date.

The News for December, 1905 (vol. xvi, pp. 317-322) gave a notice of the *Biologia* as a whole in the state to which it had then arrived: fifty completed and eight incompleted volumes. Other notes on progress made have appeared from time to

* Biologia Centrali-Americana, Zoology, Botany and Archæology. Edited by Frederick Ducane Godman and Osbert Salvin, M. A., F. R. S. Introductory Volume. By Frederick Ducane Godman, D. C. L., F. R. S. 1915. 4to. Pp. viii, 149. 2 pls. 8 maps.

time in this journal, and may be found by consulting the annual indices.

In our notice of 1905 (*l. c.*, p. 322) we quoted an announcement from the paper covers of the original parts in which the *Biologia* was published: "The Editors will give at the conclusion of the Work an Introductory Volume, wherein the physical features of the country will be described and illustrated with maps." We continued: "Mr. Champion informs us, however, that this has become doubtful, owing to the death of Mr. Salvin." Fortunately the doubt has cleared away and the volume before us is a realization of the Editors' hopes.

The contents of this Introductory Volume are as follows: A preface (pp. vii-viii), and the Introduction proper (1-86) by Dr. Godman. Resumés on the Origin, etc., of the Fauna and Flora of Central America by R. I. Pocock for the Mammalia, Arachnida—Opiliones and Acari excepted —, Chilopoda, Diplopoda and Prototracheata (87-104, 118-144), by C. Tate Regan for the Reptilia, Batrachia and Pisces (105-117) and by W. B. Hemsley for the Plants (145-149).

The first twelve pages of the Introduction are largely autobiographical and recount the early life of both editors, their meeting as students at Cambridge, their visits to Central America and to Mexico, the inception of the *Biologia* and some details of the manner in which the materials on which it is based were brought together and worked out. Salvin and Godman were very close contemporaries, the former born in 1835, the latter in January, 1834. Salvin visited Guatemala, British Honduras and Panama in 1857-58, 1859-60, 1861-63 and 1873-4. Godman accompanied Salvin on the trip of 1861 and went through Mexico from El Paso to Yucatan in 1887-1888. By their own exertions and those of collectors whom they employed, the two associates brought together in London "a very large amount of material especially among the birds and insects" from both Central and South America. Yet Dr. Godman tells us: "It was not until the year 1876 that it was suggested that the *Biologia* should be undertaken, and three years later (September, 1879) the first part appeared."

Our method of publication was to bring out six quarto parts a year; each part to contain twelve sheets made up of various subjects with six colored plates, the plates and letterpress so numbered and paged that the parts might ultimately be broken up and bound together in their respective volumes when completed. In this way it was possible to keep several subjects in progress at once, and the plan answered well. We were, however, unable to adhere to the original scheme of completing the work in 60 parts, owing to the ever increasing amount of material received from our collectors—an amount so great that 215 Parts of Zoology alone have been required, the dates of issue extending over a period of 36 years. Even now some families of insects, the Crustacea, &c., have not been dealt with—though this is chiefly attributable to the fact that no experts on these subjects were available.

On arrival in England, the various consignments were opened, every specimen labelled, with its exact locality, and the name of the collector attached. The animals sent were then sorted into their respective orders and families and as occasion offered, handed over to specialists to be worked out. It was obviously impossible that we could undertake every subject, but the birds and the butterflies we set aside for our own share of the work. The names of the various authors who kindly helped us will be a sufficient indication of our good fortune in securing the services of so many eminent men all of whom joined the enterprise with great spirit (p. 8).

For several years after my return from Mexico [in 1888], Salvin and I continued diligently to work out the material on hand and the ever-increasing amount sent over by our collectors. Salvin's failing health finally obliged him to relax his efforts, and though he still came to London as formerly, he was unable to take the same active part in the work and the difficulty of concentrating his attention on any one subject became increasingly great. He died suddenly at Hawksfold, Fernhurst, Sussex, June 1st, 1898, leaving me alone to complete the *Biologia*.

The severance of a friendship such as ours had been for forty-four years was a terrible blow to me, for we were more intimately connected than most brothers, and, besides the personal loss, I missed his knowledge and experience in all things connected with our book (p. 10).

Plates I and II, portraits of Dr. Godman and of Salvin respectively, illustrate this highly interesting personal portion of the Introduction.

Pages 13 to 43 are concerned with the "Physical Features, etc., of the Area treated," based mainly on the observations of

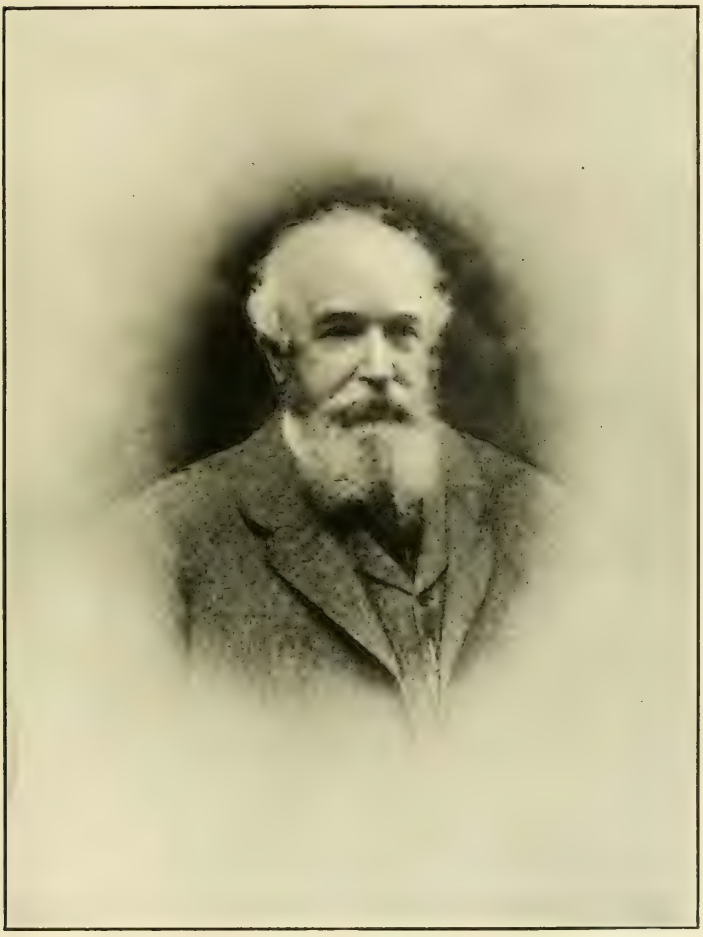
the Editors and their collectors although including descriptions from other (but by no means all available) sources. Pages 44-45 briefly enumerate the "Sources from whence our material was obtained"; pp. 46-54, "Itinerary of Mr. G. C. Champion's travels in Central America, 1879-1883," much of which appeared first in the NEWS for February, 1907 (vol. xviii, pp. 33-44). A "List" and "Analysis of Contents of each" of the 51 volumes on Zoology, 5 on Botany and 5 on Archaeology, which constitute this vast undertaking, fill pages 55 to 86.

In the Preface, dated June, 1915, Dr. Godman remarks:

> It had been our intention at the termination of the work, and after a careful study of the Zoological and Botanical material accumulated from this hitherto little known but exceedingly rich country, to have summarized the result and discussed its bearing on the interesting subject of geographical distribution. Salvin's death after a long illness, and my own advancing years and ill-health, compelled me to abandon this project, and I should have been obliged to content myself with the conclusions arrived at by the various contributors in their respective Introductions had it not been for the assistance of Messrs. R. I. Pocock and C. Tate Regan [whose essays are cited above]..... As regards the Insecta generally, which occupy such a large portion of the work, so little is as yet known of the fauna of other tropical regions that no satisfactory comparison can be made.

Of special interest to entomologists is the fact that of the 51 volumes of Zoology, 4 are devoted to Arachnida, 1 to Myriopoda and 38 to Insecta (18 Coleoptera, 3 Hymenoptera, 7 Lepidoptera, 3 Diptera, 4 Rhynchota, 1 Neuroptera, 2 Orthoptera). All the insects from Mexico and Central America and the Editors' collections of butterflies have been presented to the British Museum. "Our own general collection of butterflies probably included nearly 100,000 specimens and the beetles alone from Mexico and Central America perhaps double that number." The other insects, as presented up to 1906, were estimated as 17,525 Diptera, 10,000 Hymenoptera, 5543 Heteroptera. Subsequent gifts include 3000 Odonata, 5500 Homoptera, 6293 unworked parasitic Hymenoptera (p. 12).

The eight maps with which the Introductory volume ter-



OSBERT SALVIN,

1835-1898.

FOUNDER AND EDITOR OF THE 'BIOLOGIA CENTRALI-AMERICANA.'

minates comprise (1) a key map and (2) an orographical map of Mexico and Central America, on a scale of 1: 12,000,000 (1 inch = 189 statute miles), five (3-7) maps of portions of this area on a scale of 1 : 3,000,000 (1 inch = 47.35 stat. mi.) and (8) a map of part of Guatemala showing Mr. Champion's route 1879-1881 (1 inch = 15.5 stat. mi.), all beautifully executed.

This Introductory Volume is dedicated "To My Beloved Wife, Alice Mary Godman, who has taken the deepest interest and given me much assistance and sympathy in the completion of this work," and special acknowledgment is made in the preface to Mr. G. C. Champion and Mr. A. Cant for "valuable assistance" and "very important help."

Cervophthirius crassicornis (N.) (Anoplura).

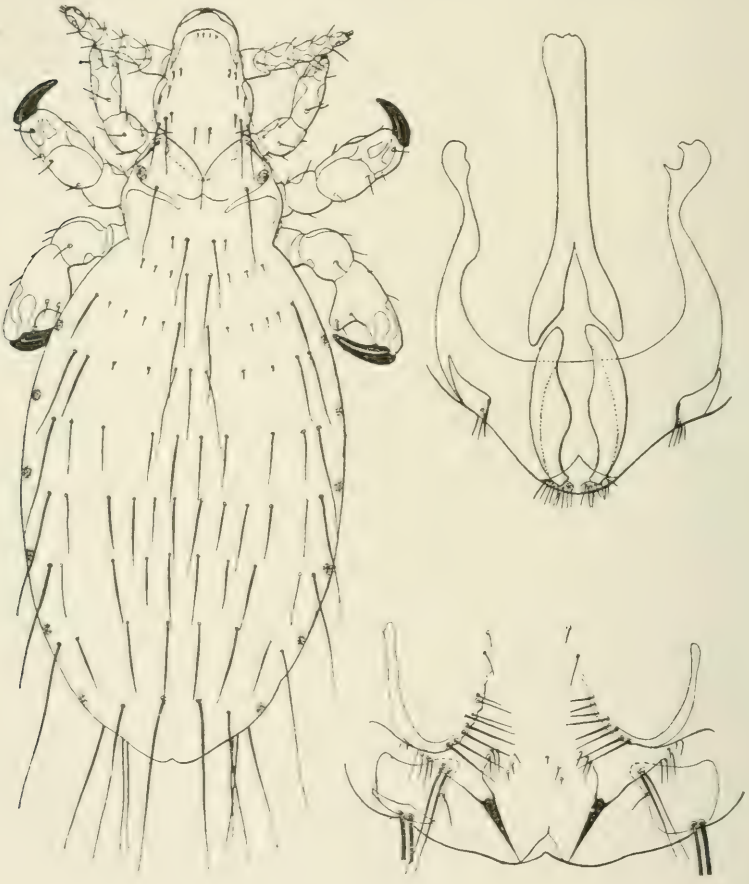
By G. F. Ferris, Stanford University, California.

Through the kindness of Professor W. B. Herms, of the University of California, the Department of Entomology of Stanford University has recently received some specimens of an Anopluran from the black-tailed deer, *Odocoileus columbianus,* taken at Laytonville, Mendocino County, California. I regard the species as identical with one *Haematopinus crassicornis* N., which has previously been recorded only from *Cervus elaphus,* the "noble stag," of Europe, the last record being that of Giebel in *Insecta Epizoa* (1874). The rediscovery of the species in North America being a matter of some interest, I had prepared a short paper for publication and was on the point of sending this to press when there came to hand a paper which necessitates an entire readjustment of my own.

The description and figure given by Giebel leave much to be desired, but there are certain peculiarities about the species that could not well be overlooked and the identification is reasonably certain. The species has nothing to do with *Haematopinus* and I regard it merely as a rather peculiar member of the genus *Linognathus.* However, Mjöberg (Entomologisk Tidskrift, Vol. 36, pt. 2-4, p. 282, Dec., 1915) has established

a genus, which he calls *Cervophthirius,* for a very closely related, if indeed not the same, species taken from *Cervus tarandus* in Sweden.

This genus differs from *Linognathus* only in the sharp posterior-lateral angles of the head and in the presence of but one row of hairs on each abdominal segment. I have available for study six species of *Linognathus* and have concluded from



Cervophthirius crassicornis (N.).

Female. (Drawing made from specimen which has been cleared in caustic potash.)

(Above) Genitalia of male. Only the more heavily chitinized parts are shown. (Below) Genitalia of female.

these, and from the illustrations of others, that the number of rows of hairs on the segments of the abdomen is hardly a suitable character upon which to split up this genus, in fact the knowledge of the genus is at present so slight that any attempt to divide it is likely to lead only to confusion. The new genus having been established, however, may be retained.

In his description of the new genus and species, Mjöberg compared them with *Solenopotes capillatus* Enderlein, a genus and species from *Bos taurus,* which were obviously based upon immature specimens. I have at hand an immature specimen of *Linognathus vituli* L., which in general appearance and in the chaetotaxy of head and abdomen agrees very closely with the description and figure of *S. capillatus.* The shape of the head does not agree, but immature specimens are very liable to distortion and are not to be too closely depended upon. The abdominal spiracles do not protrude, as they are supposed to do in *Solenopotes,* but they are disproportionately large and it is worthy of note that the figure of *L. vituli* given by Giebel in *Insecta Epizoa* indicates the abdominal spiracles as protruding. Taking all these things into consideration, I am forced to regard *Solenopotes* as a synonym of *Linognathus,* and *S. capillatus* as a synonym of *L. vituli.*

Satisfactory progress in the study of the Anoplura depends at present very largely upon the satisfactory fixing of the status of certain species which were described before the necessity for careful and full descriptions and accurate figures was fully realized, and I therefore take this opportunity to present a description and figures of *Cervophthirius crassicornis.*

The description follows. The only fully mature female available is not in satisfactory condition for measurement and this is consequently omitted.

Head about twice as long as wide. Anterior margin very roundly convex. Temporal angles moderately prominent, temporal margins nearly straight and parallel. Posterior-lateral angles sharp and prominent. Occiput much produced into the thorax. Extending across the head in front of the antennae is a conspicuous, curved, chitinized area and along each temporal margin is a narrow chitinized area. Chaeto-

taxy of the head as follows: A median group of four very small spines just behind the transverse area, four slightly larger near the base of each antenna, three along the inner edge of the chitinized area of the temporal margins, two long hairs and a short one at each posterior lateral angle and a median pair of two small hairs on the occiput. On the ventral side a single hair near the base of each antenna.

Antenna conspicuously long, the first segment longest and widest, the remainder becoming successively smaller.

Thorax shorter and considerably wider than the head and with convex lateral margins. A single long hair on each "shoulder" and one just in from each mesothoracic spiracle. Sternal plate irregularly shaped, longer than wide. Legs very large and stout, of the type common to the genus.

Abdomen elongated oval, each segment with a single row of hairs. First segment with a median group of four hairs, the outer ones very small, the inner ones quite long. Second segment with two long median hairs and with four very small hairs between each of these and the margin. Third segment with two long median hairs, four very small hairs between each of these and the margin and a long hair close to the margin. Fourth segment with three long median hairs, two very short hairs and two long hairs near each lateral margin. Five with median group of four and lateral groups of three long hairs. Six, seven and eight with median groups of five or six and lateral groups of two. Nine with five very long hairs. Chaetotaxy of ventral side very similar except that there is no row of hairs on the eighth segment.

Spiracles rather small. Gonapods blunt and rather short, each with a fringe of short hairs along its inner margin. Immediately behind each gonapod is a long sharply-pointed process with three or four hairs on each side at its base. A group of two or three long hairs at each posterior lateral angle of the ninth segment.

Description of male. Much smaller than the female and with a slightly reduced number of hairs on the abdomen, but in other respects very similar. Genitalia very heavily chitinized, the basal plate long and slender, about twice the length of the parameres. Genital plate lyriform.

Triphleps insidiosus Say Sucking Blood (Hem., Het.).

One day near the end of October, while collecting insects at White Heath, Illinois, I had the experience of being bitten by a specimen of *Triphleps insidiosus*. A companion also had the same experience. The species is well known as being of predaceous habits, but I do not recollect having seen records of it attacking man.—J. R. Malloch, Urbana, Ill.

Gall Midges of Certain Chenopodiaceae (Dip.).

By E. P. Felt, Albany, New York.

The discovery in 1913 of a species (*Aplonyx sarcobati* Felt) referable to an European genus and at that time unknown outside of the Mediterranean region, was most interesting. The rearing early this year of a closely allied genus, described below, from greasewood, adds to the interest, and on investigating the distribution of these gall midges and their close allies, it is noteworthy that none have been found outside of the Mediterranean region and the arid plains of the West. The conditions obtaining in the former section are suggestive in that they may throw some light upon probable revelations following further exploration. In the Mediterranean region, species of *Aplonyx* and *Stefaniella* have been reared from *Atriplex, Dibaldratia* and *Stefaniola* from *Salsola, Baldratia* and *Baldratiella* from *Salicornia,* while in America *Aplonyx* has been reared from *Sarcobatus* and *Protaplonyx* from greasewood, (?) *Sarcobatus vermiculatus.*

All of these genera are closely related in that they present the typical *Lasioptera* aspect. They may be distinguished by the simple or feebly dentate claws and a distinct tendency toward reduction in both the antennal and palpal segments, the former ranging in number for the seven genera above named from six to fourteen and being mostly twelve or thirteen, while five of the genera have but one palpal segment, *Stefaniella* two, and *Protaplonyx* four. There is also in this group of genera a marked tendency toward an aciculate, chitinous ovipositor.

The Chenopodiaceous flora of our great plains is at least moderately abundant and it is reasonable to suppose that there is a number of new species and possibly new genera in addition to the one described below, awaiting discovery. These saline- or alkaline-loving plants present certain characters in common and as in the case of *Aster* and *Solidago,* appear to have a peculiar midge fauna.

PROTAPLONYX n. g.

The genus has the typical *Lasioptera* wing, the normal short mouth-parts, 12 or 13 antennal segments, the third and fourth not coalescent or at least separated by a distinct constriction; quadriarticulate palpi, heavy simple claws and an aciculate ovipositor in the female. Type *P. hagani* n. sp.

Protaplonyx hagani n. sp.

The small flies described below were reared January 4, 1916, in large numbers from small, folded, swollen leaflets of greasewood (? *Sarcobatus vermiculatus*) by Mr. Harold R. Hagan, of the Agricultural Experiment Station, Logan, Utah, from material collected October 25, 1915, on the Austin farm, Wellington, Utah, in a locality near Price.

Gall. The insects appear to prevent the unfolding and cause a swelling of the leaflets, producing somewhat irregular, slightly distorted growths about 12 mm. long and with a diameter of 1.5 mm. Apparently one or more larvae may occur in each of the infested leaflets.

Larva. Length 2.5 mm., moderately stout, reddish orange. Head small, tapering to a narrowly rounded apex. Antennae bi-articulate, the basal segment disk-like, broad, the terminal segment with a length nearly four times its diameter and tapering to a narrowly rounded apex; segmentation moderately distinct; skin coarsely shagreened; posterior extremity produced as a pair of sublateral, somewhat irregular, tapering, finger-like processes with a few short, coarse setae apically.

The small larva in the preparation has a length of .75 mm., is short, stout, with both extremities broadly rounded and with no sign of the conspicuous caudal appendages described above. The skin is coarsely shagreened and unfortunately the head is concealed.

Pupa. Length 1 mm., reddish brown, the wing cases extending to the fifth abdominal segment, the leg-cases to the seventh abdominal segment, the dorsum of the abdominal segments in the male at least, thickly set with short, stout, triangular, chitinous spines.

Male. Length .75 mm. Antennae extending to the base of the abdomen, sparsely haired, dark brown; 12 segments, the third and fourth nearly free, the fifth with a length one-fourth greater than its diameter; the terminal segment, evidently composed of two, closely fused, with a length nearly three times its diameter and tapering apically to a broadly rounded apex. Palpi; first segment indistinct, second with a length about twice its diameter, slender, the third nearly as long as the second, the fourth a little longer than the third, dilated and broadly oval.

Mesonotum dull black, the submedian lines sparsely haired. Scutellum and postscutellum dark reddish brown.

Abdomen nearly naked, reddish brown, darker basally; genitalia dark brown. Genitalia; basal clasp segment short, stout; terminal clasp segment moderately long, swollen at the base and tapering apically. Harpes moderately long, swollen basally and tapering to an irregularly rounded, sparsely setose apex.

Wings hyaline, costa reddish brown, the third vein uniting with the thickened costa just before the middle, the whitish discal spot small, the fifth vein joining the posterior margin at the distal third, its branch near the basal third; halteres yellowish white apically, pale straw basally.

Coxae dark brown, legs mostly brownish straw; claws moderately slender, strongly curved, simple, the pulvilli as long as the claws.

Female. Length .75 mm. Antennae short, dark brown; 12 segments, the third and fourth narrowly fused, the fifth with a length one-fourth greater than its diameter, the terminal segment with a length nearly three times its diameter, narrowly rounded apically and evidently composed of three closely fused segments. Palpi; first segment short, irregular, the second narrowly oval, with a length over twice its diameter, the third one-half longer than the second, more slender, slightly swollen distally; terminal segment about two-thirds the length of the second, narrowly oval.

Mesonotum dull black, the submedian lines sparsely haired. Scutellum and postscutellum dark reddish brown.

Abdomen reddish brown, the basal segments dark brown, the stout ovipositor a little darker than the distal segments. Ovipositor when extended probably as long as the body, the terminal portion slender and tapering to a narrow, aciculate apex. Other characters as in the male.

Type: Cecid. a2709, State Museum, Albany, New York.

A Hermaphrodite of Andrena cressoni Robt. (Hym.).

On April 25, 1915, while collecting bees from the blossoms of plum trees at White Heath, Illinois, I obtained a specimen of *Andrena cressoni* that presents in itself certain characters of both sexes. The entire head including the color of the clypeus and sides of face is that of a male. The head is symmetrical and the antennae are both typically male. The thorax is rather stouter than that of the normal male. The abdomen is typically female and the genitalia including the weak sting is of that sex. The hind legs are identical with those of a normal female, the scopae being well developed. In the great majority of cases hermaphroditism is evidenced longitudinally; here the division is transverse.—J. R. Malloch, Urbana, Ill.

Some new Species of Athysanus and Related Genera (Homoptera).

By E. D. Ball, Logan, Utah.

(Continued from page 176)

Platymetopius trilineatus n. sp.

♂. Resembling *slossoni* in general appearance but much larger and with a dark face and a longer and definitely trilineate vertex, in the male. Length 5 mm.

Vertex longer than in the male of any known species, three times as long as basal width or length of eye, face definitely concave in profile. Elytra narrow, appressed, outer anteapical definitely shorter than the central one. Third apical cell very broad with a partially formed supernumerary cell at base. Male valve enlarged, gibbous, the margin concave to just before the blunt rounding apex, plates together broader than valve or pygofers, lateral margin concave at base, then slightly convexly rounding to the broad blunt slightly divergent apices, extending one-third their length beyond the valve and slightly exceeded by the stout pygofers.

Color: milky white and pale brown, similar to *slossoni,* vertex with a definite median white stripe extending nearly half-way back from apex and two of equal width arising just outside of this at apex and extending back just inside the black margin to just before the end of the median stripe where they almost articulate with a pair of slightly curved stripes and which in turn articulate with a pair of narrow approximate lines at the base, the whole forming an almost continuous pair of light lines from apex to base curving outward on disc. Remainder of surface composed of alternate black and white vermiculations, washed with brown at the base. Pronotum and scutellum irrorate with light brown, seven stripes on the former and the apical dots on latter white. Elytra milky white, the nervures brown, the apical and costal ones black, whole surface irrorate with pale brown except the sutural and costal margins, circular spots alongside all cross nervures and the narrow margins next the nervures. Face uniformly irrorate with brown and scarlet, omitting a white line under the vertex margin set off by black vermiculations.

Described from two males taken at Pasadena and Santa Margarita, California, by the writer. The exceptionally long trilineate vertex will at once separate this species from all others except *slossoni,* from which the dark face and widely different genitalia will at once distinguish it.

Platymetopius nigricollis n. sp.

Form of *brevis* nearly but longer, with a blunter head. Green with the head, face and below black. Length 3.5-4 mm.

Vertex in the female slightly obtusely rounded, scarcely one-third longer at apex than against eye, about equalling the pronotum; male still shorter and narrower. Face as seen from the side convex, front broad and short. Elytra compressed, venation obscure, third apical narrow. Female segment moderately long, margins parallel at the sides, the median half of posterior margin roundly produced. Male valve rather narrow, long-oval, plates together narrow, long-triangular, their acute apices exceeding the valve by one-half its length.

Color: vertex black, minutely irrorate with white, three ivory white dots at apex and an irregular basal margin ivory white. Pronotum unicolorous, green, or with a few minute black dots. Scutellum green with two black spots at base in some specimens. Elytra green, nervures unicolorous, surface peppered with minute black dots, omitting the usual circular spots, reflex nervures scarcely dark marked. Face finely heavily irrorate with dark brown or black. Below black.

Descibed from two females and two males from Mojave, California, and St. George, Utah, collected by the writer. The short black head on the definitely green body renders this a striking species. In life there was a definite golden cast that partly disappears in the dry specimens.

Platymetopius brevis var. **torridus** n. var.

♀. Form of *brevis* but with the entire insect of a fulvo-testaceous cast.

Vertex with three apical ivory dots and usually a narrow light margin on each side of the median line anteriorly. Disc irrorate with testaceous. Pronotum and scutellum fulvo-testaceous, usually unmarked. Elytra uniformly washed with fulvo-testaceous except for the usual circular spots which are milk white in striking contrast; sometimes the nervures and reflex veinlets are pale sanguineous.

Described from four females from Mojave and Calexico, California. The color of this variety is so much higher and more uniform that it would scarcely be recognized as belonging to this species as described. It is possible that all the material from the Western deserts may prove to be distinct from the Jamaica examples.

Chlorotettix delta n. sp.

♂. Size and general appearance of *tethys* but with a much sharper head. Pale green with a slightly tawny cast towards the tips of the wings. Length 4.5 mm.

Vertex right-angled, the margins straight, apex with the front sharply conical, length very slightly less than the basal width, nearly equalling the pronotum. Elytra long and narrow as in *lusoria,* giving a trim wedge-shaped appearance to the insect. Venation distinct, regular, the nervures slightly raised.

Genitalia: male valve short obtusely rounding. Plates narrow appressed, equilaterally triangular, their apices produced as minute slightly separated finger-like processes as long as the plates and equalling the rather broad and foliacous pygofers.

Color: pale green, eyes dark, the usual indented arcuated line on pronotum. Apex of vertex and tips of elytra with traces of tawny.

Described from a single male from Arizona. The conically pointed head and distinct genitalia render this a strikingly distinct form among the smaller species of this genus.

Neocoelidia ramona n. sp.

Length 3.5-4 mm. Resembling *lactipennis,* slightly narrower and with a longer vertex and more definite nervures. Female segment two-thirds as long as its width, apical margin slightly rounding. Male plates nearly three times as long as their basal width, triangularly narrowing on basal half, then rapidly roundly narrowing and together forming a single finger-like process which equals the length of the long and slightly curved pygofers.

Color: pale creamy to dirty straw, vertex creamy, a black spot on apex, a narrow median light line bordered by a pair of narrow brown ones enlarged in three points. Pale specimens may have these lines reduced to an anterior dot and a posterior crescent. Pronotum dirty straw, scutellum paler with a pair of marginal black spots in the male. Elytra pale, milky subhyaline—the female with pale brown nervures, obscure at the apex and along costa, the male smoky subhyaline with heavy brown nervures except on apical cells. Tergum and venter black in the male giving a dark cast through the elytra.

Described from two females and two males from Ravenna, California, collected by the writer. From *candida* this species can be separated by the absence of anteapical cells in the elytra, from *lactipennis* by the distinct nervures, while the male plates are longer and narrower than in any other known species.

Neocoelidia orovila n. sp.

Length 4.5-5 mm. Resembling *candida* but more slender, slightly larger and lighter colored than *ramona* with a shorter vertex. Female segment rather long, posterior margin truncate. Male plates slightly over twice longer than wide, gradually narrowing to the blunt tips.

Color: vertex light creamy, a black apical spot, three pairs of brown dots along median suture, the posterior pair sometimes connected. Pronotum creamy, scutellum creamy with two black marginal dots. Elytra creamy with brown nervures, tergum and venter pale.

Described from two females and two males from Beaumont, Chico and Oroville, California, collected by the writer. The lighter, larger male will readily separate this species from *ramona,* while the venation will easily separate it from *reticulata* and *candida.*

Neocoelidia pentagona n. sp.

Resembling *obscura* but slenderer, with a longer head and indistinct nervures. Length 6-7 mm.

Vertex almost perfectly pentagonal, the anterior margin carinate, disc almost flat, vertex as long as pronotum, longer than its basal width, pronotum short, deeply, angularly emarginate posteriorly. Elytra long, narrow, venation indistinct, a rather small outer anteapical cell present. Male plates nearly three times as long as their basal width, gradually narrowing and slightly surpassing the pygofers. Pygofers with the dorsal margins semi-circular, slightly produced as a tooth at the apex.

Color: bright straw or creamy, a black dot on apex of vertex, faint but rather broad submarginal and median orange stripes on vertex, the median one sometimes continuing on to pronotum and scutellum. Elytra pale, slightly greenish subhyaline, nervures concolorous.

Described from two females and two males from Medford, Oregon, collected by the writer. The long carinate vertex and lack of ornamentation are quite distinctive characters in this group.

Neocoelidia triunata n. sp.

Resembling *pentagona* but smaller and with a shorter vertex. Pale straw with blood red markings. Length 5.5-6 mm.

Vertex flat carinate, long, anterior margin slightly wider than long. Male plates appressed, together tubular, tapering, very long, resembling a slender Indian club, exceeding the pygofers.

Color: pale straw, vertex with a black dot at apex, a semi-circle just back of this, a triangular spot against the anterior corner of each eye and a median dot on posterior margin, blood red. Pronotum with three stripes, the median one extending across scutellum, the lateral ones arising behind the eyes and slightly widening to the outer angles of scutellum. Elytra pale subhyaline straw, with a marginal red mark on each side, the tergum showing through. Nervures indistinct.

Described from four examples from Logan Canyon, Utah, collected by the writer. The blood red markings will at once separate this species from any other described.

Neocoelidia coronata n. sp.

♀. Resembling *pulchella* in size and form, smaller and slenderer, creamy with scarlet markings. Length 6.5 mm.

Vertex acutely angled, the apex blunt, twice longer than its basal width, disc flat, the anterior margin carinate. Angle with face much more acute than in *pulchella*. Pronotum short, the margins parallel. Elytra long, venation obscure, a single anteapical cell, apical cells long. Female segment of medium length, posterior margin broadly rounding. Pygofers very short.

Color: creamy with scarlet markings, vertex lacking the customary apical black spot, a broad median stripe from the apex to just before the base, a marginal stripe against the eye on each side, extending halfway to apex where they are joined by a transverse stripe, the marginal stripe triangularly expanded opposite the eye and almost reaching the median one, the whole marking on vertex suggesting a scarlet crown. Pronotum with three parallel stripes connecting along the anterior margin and extending across the scutellum, the median one forking before the apex. Elytra creamy, a broad scarlet stripe extending along sutural margin, the apical cells slightly infumed.

Described from a single example from Central America. The striking pattern will at once separate this species and justifies its description from an unique.

Some Neotropical Parasitic Bees (Hym.).

By T. D. A. Cockerell, Boulder, Colorado.

Hypochrotaenia pilipes (Cresson).

It appears from the account given by Ducke that the genus *Nomadosoma* Rohwer, 1911, is identical with Holmberg's (1886) *Hypochrotaenia*. The type of the former is *Pasites pilipes* Cr., and of the latter *H. parvula* Holmbg.

POLYBIAPIS gen. nov. (Nomadidae).

Allied to *Nomada*, but resembling wasps of the genus *Polybia;* wings long, with only two submarginal cells (first t. c. absent), the first s. m. fully three times as long as second, receiving first r. n. a considerable distance from its end; metathorax long, very oblique; maxillary palpi long and slender,

six-jointed; labial palpi four-jointed, the two small joints rather stout. Type *Polybiapis mimus* sp. n.; also includes *P. polybioides* (*Nomada polybioides* Ducke), which is much smaller and has less yellow.

Polybiapis mimus sp. n.

♀. Length a little over 10 mm.; anterior wing 9; black, the pleura and first abdominal segment dark brown; bright yellow markings as follows; small spot on labrum; mandibles except apex; clypeus except upper margin and very broad side bands; subquadrate (longer than broad) supraclypeal patch; broad lateral face-marks which narrow above, extending to top of eye; broad band (narrowing above) behind eyes; malar space; two longitudinal distal stripes and obscure lateral (marginal) bands on mesothorax; greater part of tubercles, small spot behind tubercles; large subtriangular patch on anterior inferior part of pleura; smaller, more suffused patch on posterior middle of mesopleura; large area on mesosternum; axillar spots; rather small spots at sides of scutellum; two transverse marks on postscutellum; large marks on sides of metathorax; band along sides of first abdominal segment, and very narrow one (slightly interrupted) on apical margin; narrow bands on second and third segments, and slender ones at sides of fourth and fifth; and two broad bands on venter.

Pubescence scanty, brownish above, white beneath; eyes greenish; face smooth and polished; antennae entirely black, third joint longer than fourth; vertex coarsely punctured; mesothorax smooth and shining with scattered punctures, and a deep median groove; scutellum flattish, with a median sulcus; tegulae dark reddish, polished with a small yellow spot anteriorly; wings strongly reddened, though not very dark, the apical region paler; nervures and stigma ferruginous; b. n. meeting t. m.; coxae with yellow keels, those on middle and hind coxae very large and sharp, the latter black anteriorly; legs suffusedly yellowish in front, mainly dark brown behind, but the femora with a more or less evident posterior yellow band, very large and distinct on middle femora; tarsi bright ferruginous, middle and hind ones long; abdomen extremely minutely and densely punctured; sides of apex with black hair, but last segment with a short fringe of silver hair.

Hab.—Corcorado, Rio de Janeiro, Brazil, May 13, 1912 (*G. E. Bryant*; Brit. Museum). This is a beautiful case of "mimicry."

Odyneropsis batesi sp. n.

♂. Length about 11 mm.; black, with the sides of face, upper border of prothorax, metathorax except median band, under side of thorax and large part of coxae, more than basal half and sides of first abdominal

segment, and most of under side of abdomen, all covered with appressed silvery white hair; labrum large and broad; labial palpi very long, third joint short and stout, fourth long and cylindrical; tongue very long, extending about 2 mm. beyond labial palpi; maxillary palpi rudimentary, apparently 1-jointed; clypeus dull, granular, with a median keel, failing below; facial quadrangle much longer than broad; antennae long, brownish-black, third joint about half as long as fourth; mesothorax densely rugoso-punctate; scutellum bilobed, axillar teeth large; legs with white hair; spurs pale ochreous; small joints of tarsi pale ferruginous; tegulae large, black, punctured; wings basally hyaline, more than apical half fuliginous; b. n. going far basad of t. m.; three submarginal cells, first r. n. joining second near end; abdomen finely and densely punctate, without bands or spots.

Hab.—Ega, Brazil. (British Museum, from the Farren White collection). On account of the locality, and the remarkable "mimicry" of a wasp, it is appropriate to dedicate this species to Bates; who, indeed, very possibly collected the specimens. In Friese's key to *Rathymus,* in which he includes *Odyneropsis,* this falls next to the much larger *O. apicalis* Ducke, which occurs in Mexico.

The Genus Parnassius in America (Lep.).

By Henry Skinner.

(Plate XII)

Four species have thus far been described from North America. As in the European species, a number of names have been proposed for the variations of these very plastic butterflies. To consider the various forms in a rational manner it is necessary to fix the types of some of the earlier names, as some confusion has been caused by authors not knowing what certain names actually represented. We need more knowledge as to the distribution of these insects and also date of capture and altitude of the localities where the specimens are taken. Lepidopterists are not agreed as to the retention of names based on one sex or on size of individuals, this variation in size being usually due to difference in the altitude where the specimens are taken.

Parnassius clodius was described by Ménétries in 1855 and the locality given is California. It is well figured by W. H. Edwards in his *Butterflies of North America.* Two forms of

this Californian species were noted and both were figured by Mr. Edwards; the one he called *clarius* is not the European *clarius* and he subsequently changed the name to *baldur* Edwards. *Baldur* is immaculate on the secondaries above except for the two red spots. *Clodius* has a submarginal line of curved lines parallel to the margin. The females of the two forms differ very little, if at all, from each other.

Menetriesii Henry Edwards differs very little from the normal form. From the figure of the type it will be noted that the two red spots on the upperside of the secondaries are a trifle smaller than in the general run of specimens. It is a rather common occurrence to find that red and yellow in insects are interchangeable and in some of the species of *Parnassius* the spots may be either red or yellow. Dyar has called the *clodius* with yellow spots, *altaurus*. I believe the name should be dropped. Workers in some of the other orders do not believe in naming color phases. Mr. Oberthür has described and figured a remarkable aberration of *clodius* under the name *lorquini*. There is a dark border to the primaries and two black dashes in the cell, one near the middle and the other at the end. The secondaries are immaculate above. The writer described a *Parnassius* under the name *immaculata* which may be an aberration of *clodius*. It was taken July 30th, 1905, by Mr. J. W. Coxey, on the Fire Hole River, near Old Faithful Geyser, in the Yellowstone National Park, Wyoming.

H. Stichel in 1907 published a revision of the Parnassinae in the *Genera Insectorum*, and introduces some new names for American variations. He gives the name *claudianus* to specimens from the coast region of Washington, British Columbia and Vancouver Island. These do not differ in any way from specimens found in California and figured by Edwards. *Gallatinus* Stichel I also consider to be a synonym of *clodius*. It is represented by the figures of *clodius* given by Elrod in his *Butterflies of Montana*.

On plate I of his *Butterflies of the West Coast*, W. G. Wright gives a number of figures that show some of the variations of *clodius*. *Lusca* Stichel is an aberration with the lower

red spot on the hind wing nearly obsolete. It is practically the same thing as *menetriesii* Hy. Edw.

Clodius is found in California, Washington, Oregon, Utah, Wyoming and British Columbia. In the collection of the Academy of Natural Sciences of Philadelphia are five specimens from Corfield, Vancouver, June 25th, males, and a female, July 2nd. Three males from California without accurate data. One female labelled Columbia River (Peale collection). Of the *baldur* form there are specimens from Umatilla, Oregon; Fort Klamath, Oregon, July 27th; Kaweah, California; Mt. Shasta, California, July 14th; Ogden, Utah, July 16th, and City Creek Canyon, near Salt Lake City, Utah, July 4th.

Systematic work goes through a period of evolution first. A number of names are proposed and then the value and relationships of these names are studied, some are retained and others rejected. Of the species under consideration the two names that really seem well warranted are *clodius* and *baldur*, the relationship being subspecific. Whether the names of aberrations should be retained is a matter open to discussion.

Smintheus was described and figured by Doubleday and Hewitson in 1847. The locality cited is the Rocky Mountains. This species has also been given a number of names. *Behrii* Edw. is the variety with yellow spots instead of red. The name *sayii* was given to the female by W. H. Edwards. It is a pure synonym. *Hermodur* Hy. Edw. was described from a dark specimen of the female from Colorado. W. G. Wright named a form *niger* which is characterized by having the red spots of the inferior wings reduced to small black spots. He also called some large specimens *magnus*. We possess specimens from British Columbia that agree with his figures. This name hardly seems warranted.

Nanus Neumoegen is a small form with the upper spot of hind wing obsolete and the lower one reduced to a point. It is much like Wright's *niger* only smaller, and may have been described from extreme specimens. A series from the original locality would probably show much variation. The localities mentioned in the original description are "Fort Calgary" and

"Spence's Bridge," British Columbia. Mr. Charles Schaeffer says there are two specimens labelled type, a male and a female, in the Neumoegen collection, now the property of the Brooklyn Institute of Arts and Sciences. The male is labelled "British Columbia," and the female "Fort Calgary." There are also four specimens in the Jacob Doll collection, two males and a female from Laggan and one female from the Bullion Mts., Colorado, the latter collected by David Bruce. Mr. Schaeffer very kindly sent me the photographs of the male and female types and the female from British Columbia. Having considerable doubt about *smintheus* var. *nanus* having been taken at Calgary, Alberta, I wrote to Mr. F. H. Wolley Dod and received the following reply: *"Smintheus* occurs at Laggan and Banff, both at the eastern side of the divide. Arthur Hudson, who formerly collected with me, claims to have seen, but not captured it, about 25 miles southeast of Calgary. He is not improbably correct, and it may occur even a few miles nearer than that. In Geddes' days 'Calgary' might have meant anywhere within 50 miles or even more."

Size in *smintheus* appears to be largely governed by altiture. *Mendica* Stichel is the small form which so far as I know, is only found at high altitudes. It is figured by Mr. Edwards in volume I of his *Butterflies of North America,* pl. 4, f. 1, 4, 5, as taken on the top of Berthoud's Pass, Colorado (11,300 feet altitude), August 16th. We possess fifteen specimens of this small form, all taken at very high altitudes in Colorado, Bullion Peak, July 25th, and Berthoud's Pass, August 22nd. The exact relationship of this to *nanus* remains to be seen. *Smintheus* appears to vary more in size than does *clodius.* The females of *smintheus* vary considerably in color, some being much darker than others. The white in the centre of the red spots of the inferior wings is also quite variable in specimens found at one time in a given locality, and at times are present on one side of the butterfly and absent on the other. The form called *apricatus* by Stichel I have not seen and only know it from the figure in *Grossschmetterlinge der Erde.* The locality given is Kadiak.

We have specimens of *smintheus* from British Columbia,

northernmost point, and from the top of the Las Vegas Range, Rocky Mountains of New Mexico, the southernmost. *Smintheus* has been recorded from California, Nevada, Utah, Colorado, New Mexico, Montana and British America, although I have not seen specimens from California or Nevada.

Smintheus variety *hermodur* Henry Edwards. This was apparently described from a single female as the author says "this extremely interesting insect was generously given to me by my friend Dr. James S. Bailey, of Albany." The locality given was Southern Colorado. The females in *smintheus* in certain localities are quite dark and it is a question whether *hermodur* should have any standing. The specimen figured is from the Henry Edwards collection, now in the American Museum of Natural History, and is numbered 2791 in the Edwards collection and bears label in Henry Edwards' writing "*Parnass. hermodur,* type, Colorado." I am greatly indebted to Dr. Frank E. Lutz for photographs of *hermodur, thor* and *menetriesii.* In the collection of the Academy of Natural Sciences of Philadelphia are specimens of these dark females from Colorado and Montana. William H. Edwards figures a large form of *smintheus* under the name *hermodur,* in the third volume of his *Butterflies of North America.* The examples figured were from the Judith Mountains in Montana. These are evidently a larger form. Mr. W. H. Edwards accepted the name *hermodur* to cover all the dark females.

Parnassius eversmanni. Very little is known about this species in America. The sexes are dissimilar in appearance and have therefore been given different names. There are a number of good figures of both sexes. *Thor,* described by Henry Edwards, has been treated as a variety, but is only the female. The females appear to differ more than the males. I give a figure of the type of *thor* and it is now possible to compare it with the figures given in the European literature. The records for the species are meagre. William H. Edwards records it from the Ramparts, Alaska, two hundred miles below Fort Yukon, June 15th. Dr. W. J. Holland received nine males and one female, taken in the mountains, between Mis-

sion and Forty-mile Creeks, N. E. Alaska, July 20th-24th. The female described by Henry Edwards was taken 800 miles up the Yukon River, Alaska. At the time it was described, he probably did not know the female *eversmanni* or the figure of the female by Menetries. The species has some varietal names in Europe that are based on one sex or on very slight geographical differences.

Parnassius nomion Fisch. This species has been recorded from Alaska, but I have not seen the typical form. We possess two specimens of *nomion nominulus* Standerger that bear merely the label "Alaska." We need additional material with exact data to have a good understanding of the status of this species in North America.

Time alone will elucidate the value of the many names proposed for the variation of the very plastic species of this genus. At the present time I see no use for names based on sexual differences or on individual variation. One may often take a number of specimens of a single species, in a given locality, in a short space of time, and find that each one is different in markings from the others. For the benefit of American students, I append the references to our species published since the appearance of the supplement to my *Synonymic Catalogue of North American Rhopalocera* (1904). I have briefly indicated in the above account of the species what some of the names actually represent. Eventually the species will be placed on a firmer foundation. Dealers in butterflies in America have lamented the fact that we do not run to varietal names as is the case in Europe where there is a good market for these slight variations.

LITERATURE.

H. Stichel, Genera Insectorum, Parnasiinae, 1907.
eversmanni, p. 13, pl. 1, f. 3, ♂.
thor H. Edw. is treated as a subspecies.
baldur Edw. p. 14, pl. 2, f. 4, ♂ is treated as a subspecies.
lusca, Stichel, p. 14, as a new form.
menetriesii Edw. p. 14, as a form.
lorquini Oberthur, p. 14, as a form.
claudianus Stichel, p. 15, as a new subspecies and cites the figure of *clodius* Verity, Rhop. pl. 22, f. 17-19 (1907).
gallatinus Stichel, p. 15, as a new subspecies. He refers to Elrod's figures of Montana specimens.

mendica Stichel, p. 20, new form.
hermodur H. Edw., p. 20, as a subspecies.
sayii Edw., p. 20, as a doubtful subspecies.
nanus Neum., p. 20, as a doubtful subspecies.
behrii Edw., p. 21, as a subspecies.
niger Wright, p. 21, as a form.
magnus Wright, p. 21, as a subspecies.

H. Stichel, in Grossschmetterlinge der Erde, Fauna Americana, 1907.
apricatus Stichel, p. 48, pl. 17*d*. Described in Berlin Ent. Zeit., Vol. 51, p. 87, pl. 2, f. 13, ♂, ♀, 1906 (Kadiak Isld.).
The following are figured on pl. 17 of the Fauna Americana; *claudianus*, ♂, ♀; *clodius*, ♂, ♀; *behri*, ♂; *apricatus; sayii; menetriesii; baldur*, ♂; *hermodur*; *smintheus*, ♀; *lusca*. The figure of *behri* does not represent the yellow-spotted variety described by Edwards.
eversmanni, ♂, ♀, are figured in Grosssch. der Erde, Fauna Palaearctica, Vol. I, pl. 10.

Roger Verity, Rhopalocera Palaearctica, 1909-1911.
nomion, p. 64, pl. 13, f. 6-13.
var. *nominulus*, p. 67, pl. 14, f. 15, 16.
var. *smintheus*, p. 70, pl. 16, f. 18-23.
eversmanni, p. 93, pl. 22, f. 6-9.
clodius, p. 95, f. 17-19.
apricatus, p. 106.

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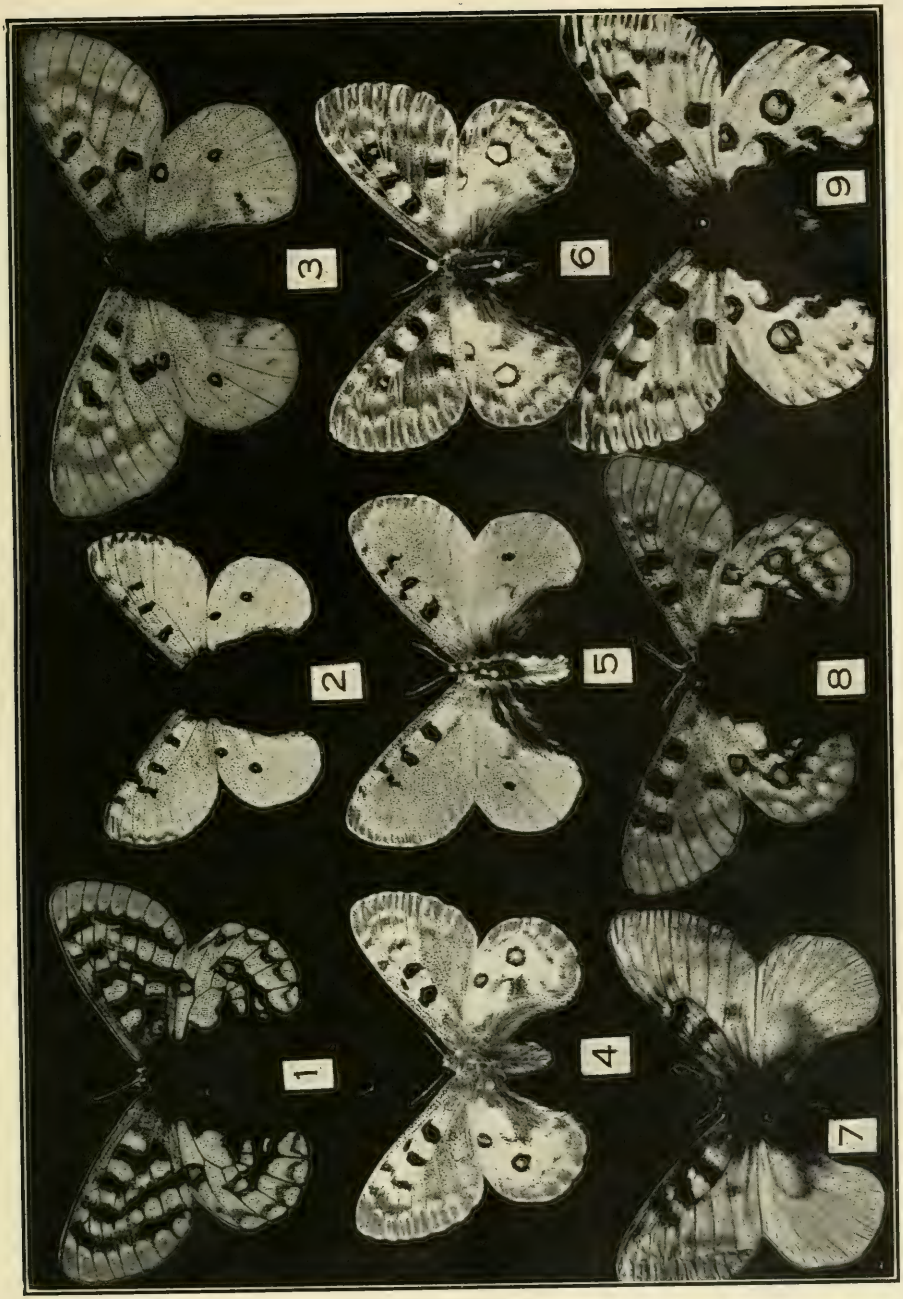
nominulus Staudinger, Iris, 7, 241, 1894.
nomion Oberthur, Etud. Comp. 9, p. 85, pl. 264, 1914.
immaculata Skinner, Ent. News, 22, 108, 1911.
smintheus Doubl.-Hew. Newcomer, Ent. News, 21, 316, 1910.
(life history)
Wolley Dod, Can. Ent. 40, 188, 1908 (Laggan & Banff, Alberta).
clodius Mén., Cat. Mus. Petr. 1, 73, 1855.
Edw., But. North Amer., figs. 5, 6, ♂, 1871.
Wright, But. West Coast, pl. 1, f. 1, b, 1905.
Stichel, Grossschm. der Erde, Faun. Amer., pl. 17, d, 1907.
claudianus Stichel, Gen. Insector. Parnassiinae, p. 15, 1907.
Stichel, Grossschm. der Erde, Faun. Amer., pl. 17, c, 1907.

Explanation of Plate XII.

1. *P. thor* Hy. Edws. Alaska. Type. ♀.
2. *P. mendica* Stichel. Colorado.
3. *P. menetriesii* Hy. Edws. Cotype. Utah. ♀.
4. *P. nanus* Neumoegen. Ft. Calgary. Type. ♀.
5. *P. nanus* Neumoegen. British Columbia. Type. ♂.
6. *P. nanus* Neumoegen. British Columbia. ♀.
7. *P. immaculata* Skinner. Yellowstone Natl. Park. Type. ♂.
8. *P. hermodur* Hy. Edws. Colorado. Type. ♀.
9. *P. nominulus* Staudinger. Alaska. ♂.

There are two specimens of *menetriesi* in the American Museum of Natural History marked type. One bears number 2783 in the Edwards collection and has the name on it in the writing of Henry Edwards. The locality is Truckee, Sierra Nevada, California. This may be taken as the type. It is practically identical with the figure of the cotype shown on the plate.



PARNASSIUS IN AMERICA—SKINNER.

1. THOR, 2. MENDICA, 3. MENETRIESII, 4–6. NANUS, 7. IMMACULATA, 8. HERMODUR, 9. NOMINULUS.

Description of Two new Tachinids (Dip.).

By Charles H. T. Townsend, Bureau of Entomology, Washington, D. C.

The following species are described at this time in order to allow the use of the names in forthcoming economic papers.

Doryphorophaga aberrans n. sp.

Length of body, 6 to 7.5 mm.; of wing, 4.5 to 6 mm. Differs from *D. doryphorae* by facialia not ciliate, at most some bristles on lowest one-third; ocellar bristles vestigial or wanting; abdomen thickly silvery pollinose; front golden posteriorly; tegulae of ordinary size.

Four males, Blacksburg, Virginia; three reared from *Leptinotarsa decemlineata* Say, and one from *Blepharida rhois* Forst. (W. J. Schoene).

Holotype, No. 20126 United States National Museum.

This is an eastern form. *D. doryphorae* is from the Mississippi valley and westward.

Euphorocera floridensis n. sp.

Length of body, 11.5 mm.; of wing, 8 mm. Differs from *E. tachinomoides* as follows: Parafrontals and parafacials deep golden, also orbits. Abdomen without any red on sides; the posterior black of intermediate segments produced forward in a triangle on each side to near front margin, heavy on second segment, these forming with median vitta a black trident on those segments.

One male, Gainesville, Florida; reared from *Anticarsia gemmatilis* Hubn. (J. R. Watson).

Holotype, No. 20127 U. S. Nat. Mus.

Certain Features Found in the Genus Panchlora, with other Observations and the Description of one new Species (Orthoptera, Blattidae).

By Morgan Hebard.

In studying material of this genus introduced into the United States, it has become necessary to examine all the series in the Philadelphia collections, a total of 247 specimens, representing at least 24 species.

The genus is undoubtedly difficult, but were the males described with full reference to the supra-anal and subgenital plates, cerci and styles, only rare specimens showing some de-

gree of aberration from the normal type would prove to be difficult to determine. As the matter stands, however, scarcely anything of use can be found in the literature on the genitalia of the numerous described species. Those of distinctive marking and coloration can usually be located, but among the descriptions of the plain green forms (with or without minute dots on the wings and with immaculate antennae and no dark lines on pronotum or tegmina) seldom anything of diagnostic value may be found. It is evident that the types of the species, thus insufficiently described, must be studied before the nomenclature of the plain forms of the genus may be put on anything like a secure basis. In the meantime, we only urge that, in studying such material, the male genitalia be always carefully considered. The females offer scarcely any genital features; as a result, while the sexes of the more distinctively colored specimens are rather easily associated, those of some of the plain green species are difficult in the extreme.

Male Genital Characters.

The supra-anal plate in different species has the distal margin weakly convex, transverse, weakly angulate-emarginate or strongly emarginate. Though constant in most species, this margin varies in at least one very widely distributed form from very weakly convex to distinctly obtuse-angulate emarginate. The cerci are of subequal width throughout with apex broadly rounded, distinctly tapering with apex sharply rounded, or tapering to last joint which is slender and elongate, while differences in length are also found in different species. Very little variation is found in these appendages in the majority of species, but in one widely distributed form not only do they vary in length, but also in proportionate diameter. The subgenital plate has the distal margin between the styles transverse, triangularly produced with apex rounded, triangularly produced but weakly emarginate mesad, and weakly convex to strongly produced sinistrad and so asymmetrical in different species. Very little variation is found in this feature. The styles are elongate cylindrical, varying

from minute to relatively large in different species, reaching from about one-sixth the distance to the cercal apex to nearly the apex of those appendages.

Female Genital Characters.

The degree of production and median emargination of the supra-anal plate is not a feature of diagnostic value, while the cerci, which Shelford has stated to agree with those of the opposite sex,[1] we find to be much less specialized than in the males and in the great majority of species useless as a diagnostic character. The subgenital plate is also generally similar in most of the species but in one before us, *thalassina,* it is found to be very much more deeply concave mesad than is usual.

Overestimated Characters.

The width between the eyes is always less in the male sex than in the female: the character is not of considerable help in all or even many of the species, as Shelford has implied,[2] but only in those in which decided differences in this feature occur. On the whole, if slight differences were employed in sorting series, these would prove not only unsatisfactory but dangerous diagnostic features.

In the female sex, some species have the transparent margins of the pronotum and tegmina much clouded or even solidly opaque; the males of these species show this condition to a very much less degree or not at all.

Minute dark brown dots are found on the tegmina in a number of species. The number of such dots is individually variable, and they are found both present and absent in individuals of the same species. Overestimation of the value of the number and position of such dots has unquestionably led to the erection of a number of synonymic names.

Distinctively Marked Species.

In the species having the antennae annulate, the pronotum with narrow lateral black lines, or other distinctive features of

[1] Trans. Ent. Soc. London, 1907, p. 463, (1908).

[2] Trans. Ent. Soc. London, 1907, p. 464, (1908).

coloration or marking, not only are genital features to be found but also the character of the antennal annulation, cephalic, pronotal and tegminal color pattern and general coloration, afford excellent diagnostic features. In a number of these species, general size and form and width of tegmina prove to be of excellent value in further distinguishing the species.

Nomenclature.

The names,[3] in the order in which they have been proposed, are, for the plain green species: *nivea, chlorotica,*[4] *viridis, virescens,*[5] **exoleta, *prasina, *cubensis, antillarum,*[6] *poeyi,*[7] *glauca,*[8] *peruana, luteola, lancadon, *thalassina, punctum.*

For the species having the antennae annulate and the pro-

[3] An asterisk before a name in the present list indicates that the species is represented in the material before us without question of determination.

[4] This name must be considered unidentifiable. The original description and figure are both wholly inadequate for locating the species. The type is no longer in existence and was described from the Cape of Good Hope, a locality either in error or the type was an adventive specimen, for none of the plain green species of *Panchlora* are found native in Africa. In any case, description, figure and locality, all are valueless.

[5] Shelford, who has examined the types of both *nivea* and *virescens,* places the latter name in the synonymy under *nivea.*

[6] This name is an evident synonym of *cubensis*; the description shows no feature of real diagnostic value. In the extensive series before us from the West Indies, but a single species of plain green *Panchlora* is found.

[7] This name is also a synonym of *cubensis,* (see footnote 6). The type is a male, the types of *cubensis* and *antillarum* females; the sexual differences led Saussure to describe the present specimen as distinct.

[8] Brunner has, in our opinion, correctly synonymized this name with *prasina.* Saussure and Zehntner have resurrected *glauca* in the Biologia, with apparently only the type of that species before them, giving there for the first time "oculi plus quam eorum latitudine remoti" as is true for *prasina.* The name *glauca* was evidently based on a small example of *prasina,* showing an unimportant variation in the subgenital plate. We have now before us an example of *prasina* larger than any other specimen in our series of the genus and other smaller specimens of which the smallest is no larger than the type of *glauca.*

notum without narrow dark lateral lines: *hyalina* of Saussure, *nigricornis*, **acolhua*, **fraterna*, **montezuma*, *cribosa*, *festae*, *translucida*.[9]

For the species having the antennate annulate and the pronotum with narrow dark lateral lines: *quadripunctata*,[10] *pulchella*, *azteca*, *zendala*, **mexicana*, *moxa*, *erronea*, *tolteca*, *najas*, *latipennis*, **nigriventris*.

Kirby has, in addition, placed *alcarazzas* in the present genus with a query.

Order of Linear Arrangement of Species.

In the linear arrangement of the species of the genus we consider that those which we term the plain green species should properly appear before the more distinctively colored forms. Of the plain green forms we would place first the species having in the males the distal margin of the subgenital plate transverse, next those having this margin triangularly produced, here including the few more distinctively colored species also showing this feature, and last those species having this margin produced sinistrad and asymmetrical, after which follow the majority of the more highly colored species which also show this condition.

The following small plain green species must shortly be recorded in a paper by Mr. James A. G. Rehn. As it is evidently new, we offer the following description.

Panchlora bidentula[11] new species.

The present species belongs in the second division of the genus as arranged above.

Type: ♂ ; Igarapé Assu, Pará, Brazil. January 17, 1912. (H. S. Parish.) [Acad. Nat. Sci. Phila. Type No. 5295].

[9] This name has been proposed by Kirby for the species described as *hyalina* by Saussure, which Kirby considered preoccupied by *Blatta hyalina* of Stoll. As Stoll's description contains not a single character of specific diagnostic value and as the type is not extant we consider his name unidentifiable and in consequence *hyalina* of Saussure must stand.

[10] Selected as type of the genus by Kirby, Synon. Cat. Orth., I, p. 154, (1904).

[11] In allusion to the minute mesal productions of the margin of the male subgenital plate.

Size small, form moderately slender. Head with eyes very broad in front; separated by a very brief space in width less than one-tenth the greatest diameter of the eye. Pronotum and tegmina of normal form, the clear margins of these parts somewhat tessellate with greenish and in consequence partially opaque. Tegmina and tegminal veins very delicate. Femora with normal hairs and spines extremely delicate. Supra-anal plate subrectangulate, decidedly transverse but still produced beyond the apex of the produced subgenital plate, dorsal surface weakly concave and covered with short hairs; lateral margins straight and longitudinal to rather broadly rounded disto-lateral angles, between these the distal margin is truncate, transverse with a minute mesal emargination. Cerci small, extending very slightly beyond distal margin of supra-anal plate, tapering very gently and evenly to flattened, narrow and rather sharply rounded apex. Subgenital plate transverse, symmetrical, weakly triangularly produced distad, the lateral margins not strongly convex to brief mesal portion which is weakly concave, this concavity on each side terminated by very minute triangular projections of this margin. Small cylindrical styles situated on this margin at the inner margin of the base of the cerci and equal to about one half the cercal length.

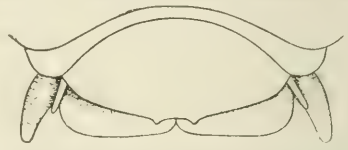


Fig. 1.—*Panchlora bidentula, n. sp.* Ventral outline of cerci and subgenital plate of type. (Greatly enlarged.)

The female of the species is unknown.

Measurements (*in millimeters*).

♂♂	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
Caparo, Trinidad. *Paratype*	12.7	3.6	4.5	13.2	4.4
Igarapé Assu, Brazil, TYPE	12.3	3.4	4.4	12.2	4.
Igarapé Assu, Brazil. *Paratype*	12.3	3.5	4.4	12.7	4.3

Coloration. Dorsal surface light lumiere green fading to hyaline distad on tegmina. Lateral margins of pronotum and field of tegmina hyaline, weakly obscured with greenish. No traces of lateral cream colored lines on pronotum and tegmina, so often found in the plain species of *Panchlora*. Eyes very dark brown, the very brief interocular space ferruginous; head otherwise unmarked. Antennae antimony yellow, immaculate. From one to two minute and inconspicuous brown dots are present on the tegmina in their distal half.

Specimens Examined: 5; 5 males.

Caparo, Trindad, VI, 1913 (S. M. Klages), 2 ♂,[12] [A. N. S. P.]; VIII, 1913 (S. M. Klages), 1 ♂, *paratype* [Hebard Cln.].

Igarapé Assu, Pará, Brazil, I, 17, 1912 (H. S. Parish), 2 ♂, TYPE and *paratype* [A. N. S. P.].

[12] In these specimens the caudal margin of the subgenital plate is slightly uneven mesad; in one the minute projections are not decided, in the other they are suggested merely by angulations of the margin.

Descriptiones Hymenopterorum Chalcidoidicorum Variorum cum Observationibus. III.

By A. A. Girault, Glenndale, Maryland.

Eupelmus inyoensis new species.

♀. Closely allied to *juglandis* Ashmead but differs in having the middle tibiae metallic except at each end (hence the legs concolorous except the knees, tarsi and tips of tibiae) and the caudal tibiae all distinctly metallic. Distal three tarsal joints black. The abdomen is somewhat more slender than with *juglandis* and the postmarginal vein is only slightly longer than the stigmal (much longer in *juglandis*). Otherwise about the same. Differs from *brevicaudus* Crawford in the coloration of the legs only.

♂. Similarly colored. Compared with types of the named species.

Described from five females on tags in the United States National Museum labelled "428 Inyo County, California."

Types: Catalogue No. 20130, U. S. N. M., the above specimens, an antenna on a slide.

Eupelmus coccidis Girault.

Differs from *limneriae* Howard only in bearing no metallic on the caudal tibiae. One female among the type material of *brevicaudus* Crawford and similarly labelled; the caudal femur was nearly all metallic centrally. There is slight metallic laterad at apex of cephalic femur.

Pseudomphale ancylae new species.

♀. Like *lixivorus* Crawford but a third smaller and differing most noticeably in that the distal *half* of each tibia is white not merely the tips. Differs also in the following particulars: Segment 2 of the abdomen is distinctly longer being about half the length of that region and moreover it does not show a broad cross-stripe of scaliness distad (and which widens laterad) as does the other species but its distal half bears rather dense, exceedingly delicate pin-punctures; the other abdominal segments dorsad do not show a distinct, rather coarse scaliness; the petiole is somewhat longer than in *lixivorus* and the propodeum glabrous (except within the grooves). Scutellum subglabrous.

Postmarginal vein very slightly longer than the short, usual stigmal: funicle joints subglobular, 1 a little the longest, a little longer than the pedicel, club with a distinct terminal spine. Mandibles bidentate and with four or five minute teeth within.

♂. The same but the club is solid, the funicle 4-jointed (three ring-joints), the joints 3 and 4 subequal, globular, longer than the pedicel, 1

somewhat longer than wide, the scape short and dilated ventrad, the flagellum clothed with rather dense, soft greyish hairs.

Described from one pair reared from *Ancylus nubeculana,* Winchester, Virginia, April 1, 1915 (B. R. Leach).

Types: Catalogue No. 20131, U. S. N. M., the above pair on tags, the heads and a pair of female wings on a slide.

Pseudomphale steirastomae new species.

♀. Differs from *metallicus* Ashmead in that the cephalic femur is concolorous (in the type female, the cephalic legs yellow except coxae in the other species) and the tibiae are distinctly marked with black; in *nigrocyaneus* Ashmead, the tibiae are all white and the propodeum mostly glabrous; closely allied with *lixivorus* Crawford but differs in having the cross-stripe of scaliness on segment 2 of the abdomen distinctly shorter and less distinct, the eyes are larger; *floridanus* (which differs from *microgaster* mostly in the male sex) has the tibiae all white, the propodeum glabrous and the second abdominal segment with minute pin-punctures (except broadly at base); from *brasiliensis* in having the tibiae dark, the second segment of the abdomen shorter (only somewhat less than half the length of the abdomen not three-fourths its length as in *brasiliensis*) and the different sculpture of the latter; from *ancylae* in the different coloration of the legs, the scaly propodeum and the different sculpture of the second abdominal segment; from *hypatia* in the scaly propodeum only. Of the stature of *hypatia.*

The pedicel is elongate, somewhat longer than funicle 1; funicle 3 is somewhat closely attached to the club so that region superficially appears 3-jointed (transition, no doubt).

♂. Similar; its funicle 4-jointed, the joints short, the scape dilated. Three ring-joints. Funicle 1 subequal to the club (more or less) nearly twice longer than wide, the others subquadrate. Mandibles bidentate and with four or five comblike teeth following the acute second tooth.

Described from six males, four females reared from the larvae of *Steirastoma depressum,* Erin, Trinidad, British West Indies, January, 1913 (F. W. Urich).

Types: Catalogue No. 20132, U. S. N. M., one female, three males on tags and a head of each sex on a slide.

Pseudomphale graciliventris new species.

♀. Of rather small size for the genus. Similar in stature and so forth to *atroscapus* Girault but the abdomen is more slender and graceful and differs in sculpture, there being no distal cross-stripe of scali-

ness, as in the Florida species, but instead there is a similar area of dense minute pin-punctures (extending broadly over half way to base along the meson); the second abdominal segment is a little longer. Also the funicle joints are somewhat longer, 1 somewhat longer than the pedicel.

♂. Similar (but segment 2 of abdomen occupying the entire surface?); funicle 4-jointed, the club solid, the scape distinctly compressed. Funicle 1 somewhat longer than the pedicel, 4 subequal to the pedicel.

Described from one male, seven females reared from an egg-mass of a Cassidid, Erin, Trinidad, British West Indies, March, 1914 (F. W. Urich).

Types: Catalogue No. 20133, U. S. N. M., five females on tags, male and female antennae on a slide.

Psilophrys pulchripennis Ashmead. Genotype of *Habrolepopteryx* Ashmead.

Mandibles rather long, with three acute, subequal teeth; head shaped as in *Berecyntus;* scrobes forming a distinct semicircular depression; frons moderately narrow; club 3-jointed. Funicle 1 twice longer than wide. Frons subprominent; eyes not very large, longer than the cheeks. Knees, tips of tibiae (broadly in cephalic tibiae), tarsi and the long middle tibia, lemon yellow. General habitus of *Paracalocerinus australiensis* Girault except the ovipositor. From types in the U. S. N. M. The generic description is otherwise correct.

Habrolepopteryx pulchripennis Ashmead, **aeneiscapus** new var.

♀. Similar to the genotype but the scape is concolorous.

Types: Catalogue No. 20134, U. S. N. M., the specimens on tags. From two females, part of the type of the typical form.

Paracalocerinus americanus new species.

♀. Agrees with the description of *australiensis* but the ovipositor is extruded somewhat farther, the oblique eye-spots on the fore wing are larger, their distance from the wing apex is much greater, the cephalic one against the short postmarginal vein (as in the genotype) and besides the fore wing bears a conspicuous longitudinal hyaline streak along the middle from a point between the oblique eye-spots (where it is narrowest) to apex (where it is broadest). The postmarginal vein is slightly longer than the stigmal (the marginal linear, six or more times longer than wide). The frons a little narrower than in the genotype, the scrobes longer and more distinct (the head is somewhat as in *Habrolepopteryx* but the inflexion is less) yet not very long, the mandibles stouter. Funicle 1 smallest, somewhat like a

large ring joint, 2 longest, somewhat longer than wide, 3 quadrate, longer than 1, the others wider than long. The pedicel is somewhat longer and the sculpture of the body is finer than with the Australian species.

Described from one female in the U. S. N. M., from Onaga, Kansas (Crevecoeur).

Type: Catalogue No. 20135, U. S. N. M., the thorax on a tag; rest of the body on a slide (including wings) with a female of *australiensis* (Kuranda, Queensland, forest, September, A. P. Dodd).

(Eupelmus) Aphidencyrtus schizoneurae (Ashmead).

The tibiae are dark, the mandibles as in *aphidiphagus*, that is, the third tooth truncate. The type female is in bad condition, without wings. The frons is wider than usual.

Holcencyrtus physokermis new species.

♀. Length, 1.10 mm. Dark metallic green, the wings hyaline, the venation dusky, the blade of the wing very slightly infuscated distad and caudad of the marginal vein; knees, tarsi and apex of the tibiae pale, middle tibiae more broadly pale at tip, distal tarsal joint dusky.

Pedicel somewhat longer than wide at the apex, subequal in length to joints 1 and 2 of the funicle which are subquadrate; funicle 6 no longer than 1 yet somewhat wider; club two-thirds the length of the funicle and somewhat wider, its joints larger than those of the funicle.

Head and thorax densely scaly, the vertex, scutum, axillae and scutellum with scattered minute setigerous punctures which are not dense yet rather numerous. Axillae slightly separated. Mandibles of tolerable length, their teeth short, equal, the first two acute, the third obtuse but not broad. Head (cephalic aspect) quadrate, the frons broad, not prominent, the eyes ovate, not large, slightly longer than the cheeks. Face inflexed. Pronotum transverse linear.

Marginal vein quadrate or a little longer than wide, thick, the postmarginal and stigmal veins subequal, a half or more longer than the marginal. Hairless line not closed caudad, with six or more lines of cilia proximad of it (these cilia enclosing proximad a triangular naked space). Costal cell broad (with four or five lines of discal cilia). Fore wings ample, densely, finely ciliate.

Ovipositor inserted distad of middle, the abdomen from its insertion, obliquely truncate.

Proximal tarsal joints not long (longest in the middle legs, shortest in the cephalic ones).

♂. The same but the marginal vein is over twice longer than wide, somewhat longer than the postmarginal or stigmal; cephalic and middle legs, caudal femora and tarsi (except last joint), a cinctus on caudal

tibiae joint below the knee and tips of caudal tibiae and the antennae except the pedicel and dorsal edge of the scape, pale lemon yellow. Scape short, convexed distinctly beneath; pedicel globular; funicle joints narrowed at each end, shorter than the solid club, clothed with long, scraggly hairs, subequal, 6 thickest, two and a half times longer than where widest.

Described from one male, twelve females reared from *Physokermes picea,* Madison, Wisconsin, May 12, 1915, June 30 (F. A. Fenton).

Types: Catalogue No. 20136, U. S. N. M., one male, six females on a slide (with other male encyrtids); two females on a slide as paratypes.

Encyrtus ensifer Howard.

The mandibles are only *bidentate,* the second tooth broadly truncate.

Xenocrepis mexicana new species.

♀. Length, 1.55 m.. Dark metallic blue, the wings hyaline, the venation fuscous, the knees, tibiae (except sometimes the caudal tibia just below the knee, a fuscous band), tarsi and scape pale yellow; rest of antennae blackish, the pedicel lighter.

Head and thorax densely scaly punctate, the dorsal abdomen glabrous except distad where there is delicate scaliness. Head wider than the thorax, rather thick, the occiput obscurely margined. Antennae inserted a little above the middle of the face; pedicel a little longer than wide, barely longer than funicle 1 which is very slightly longer than wide, 3 quadrate, 5 slightly wider than long; the three ring-joints all short, 1 a little the shortest. Flagellum filiform, the club joints subequal to funicle 1. Mandibles 4-dentate.

Postmarginal vein elongate, nearly as long as the slightly thickened marginal, nearly twice longer than the slender stigmal.

Propodeum finely punctate, with lateral carinae, no median, from lateral aspect with a short, subglobose neck, conical, much longer at the meson than at the spiracle, the latter small, cephalad. Parasidal furrows only cephalad. Abdomen with a very short petiole from beneath the propodeal neck, slightly longer than the rest of the body, pointed conical, not produced beneath, its second segment longest, occupying somewhat over a third of the surface.

Cephalic femur not swollen.

♂. Similar except that the body is weaker and the tibiae metallic except at each end.

Described from ten males, four females on tags in the U. S. N. M., labelled "*Scymnophagus townsendi* Ashmead, 6427° = 6. Townsend. Issued November 30, 1894. Type No. 12725, U. S. N. M."

Types: Catalogue No. 12725 U. S. N. M., the above specimens and a slide bearing a head of each sex, a male first femur and three female caudal legs.

The species is parasitic on a Scymnid larva which preys upon *Lecanium oleae* on orange, San Luis, Mexico. Also at Monterey, Mexico, from the larva of *Azya orbigera*. The scutellum has a delicate cross suture near its apex.

Polynema piceipes Girault.

The legs are concolorous as the name indicates.

Collecting Papaipemae (Lep.).

By Alex Kwiat, Chicago, Illinois.

My object in writing on this subject is not particularly to recount my own experiences but to serve as a guide to others, who, by its aid, might become interested and succeed in adding to our knowledge of the various species of *Papaipema* and their life histories.

A great deal of careful and painstaking work on this group has been done by Mr. Henry Bird and others during the last eighteen or twenty years and the results published from time to time. My intention is merely to summarize a few of the known facts so that anyone who wishes to do so can seek intelligently for the larvae of species whose food plants and habits are known and rear them to maturity. Anyone working along the lines suggested will not only add materially to his collections but also may discover new species and the life histories of others hitherto unknown.

In general the larvae of the Papaipemae are borers in the stems or roots of persistent annuals or perennial plants and, in at least one instance, in the young shoots of an indigenous tree.

The moths appear rather late in the year, the earliest species about August 15th and the latest about October 5th. They are sluggish of habit and seldom fly far from their breeding place. This sluggishness and the late period of flight accounts for their scarcity in collections.

Eggs are deposited on or near the food plant and hatch the

following spring and by the middle of May, in some instances, the work of the young larvae may be observed. A wilted or yellowing leaf or stunted growth often tells the tale and almost invariably the presence of frass at or near the opening by which the larvae entered, indicates its whereabouts. Often a leaf will wither from some other cause in which case the absence of frass renders further search needless. Where no indication but the presence of frass is mentioned, it will be found that affected plants are usually stunted or shorter than those unaffected.

The larvae are readily recognized by their characteristic markings up to the penultimate stage. They are usually of a brownish color with five longitudinal pale stripes. These stripes are in some species continuous throughout, in others with only the dorsal stripe continuous and in a third group with all stripes interrupted at the first four abdominal segments by a dark-purplish brown band which encircles the body and is a character appearing more or less strongly on all the larvae during the earlier stages.

Pupation sometimes takes place in the burrow but more often in the ground and the pupal period lasts from four to five weeks.

It may be assumed that a species is found or is likely to be found wherever its food plant occurs. Where the life history is unknown, I have shown as habitat, the places where captures have been reported.

The species are here listed alphabetically and no attempt is made to indicate synonymy, the latest authentic name only being given.

anargyrea Dyar.—Life history unknown. Habitat, Colorado.

angelica Smith.—In "stem" and "root" of *Psoralea macrostarcha*. Habitat, California.

appassionata Harvey.—In root of Pitcher Plant (*Sarracenia purpurea*). Pupates in ground August 1st to 10th. Evidence, orange-colored frass. This larva usually changes to a new plant early in July.

arctivorens Hampson.—In stem and root of Burdock (*Arctium lappa*); also in thistles (*Cirsium hillii, lanceolatum* & *arvense*). Pupates in ground about August 10th. Evidence, frass.

astuta Bird.—In stem and root of Stone Root or Horse Balm (*Collinsonia canadensis*). Pupates in ground August 1st-10th. Evidence, white frass and dry stalk.

aweme Lyman.—Life history unknown. Habitat, Manitoba.

cataphracta Grote and var. **fluxa** Bird.—Very general feeder in Burdock, Thistle, Parsnip and other plants, in stem and root. Pupates in its burrow about August 10th. Evidence, dwarfed or sickly plant, often breaking at opening.

cerina Grote.—In stem of *Lilium superbum*. Pupates in ground about August 1st. Evidence, small hole and little frass.

cerussata Grt. & Rob.—In stem and root of Ironweed (*Vernonia noveboracensis*). Pupates in ground about August 5th. Evidence, frass and burst and often bent stem.

circumlucens Smith.—In stem and root of Dogbane (*Apocynum androsemifolium* and *canabinum*); also in *Baptisia tinctoria* and other plants. Pupates sometimes in burrow, more often in ground, about August 1st. Evidence, wilted or brown foliage in July or if stem is very thick it merely bends at the opening. There is much frass of a reddish color.

duovata Bird.—In stem and root of *Solidago sempervirens*. Pupates in burrow about August 15th. Evidence, several openings in stem.

duplicata Bird.—In root of Stone Root (*Collinsonia canadensis*). Pupates in burrow about August 15th. Evidence white frass and dry stem.

errans B. & McD.—Life history unknown. Habitat, Arizona.

erubescens Bird.—In Thistle (*Cirsium occidentale*). Pupates in burrow about July 25th. Evidence, frass.

eupatorii Lyman.—In lower stem and root of *Eupatorium purpureum*. Pupates in burrow August 1st to 10th. Evidence, frass.

frigida Smith and var. **thalictri** Lyman.—In root of Meadow rue, (*Thalictrum*). Pupates in ground about August 1st. Evidence, very slight, little frass. Not rare.

furcata Smith.—In young shoots of Ash. Pupates in ground about July 20th. Evidence during July, dried black terminal leaves. The fresh shoot is first entered and when the larva leaves it a new burrow is made, often a considerable distance lower, in the preceding year's woody growth. Here only a clean cut hole is visible, as the frass, being unusually dry, drops to ground and scatters. If the terminal work is evident, a slight bending of the woody portion will cause a sharp break at the point where the larva is to be found. Should be located early but not taken in until shortly before pupation, as ash stems dry too quickly and larvae will not thrive.

harrisii Grote.—Lower stem and root of *Heracleum lanatum.* Pupates in ground about July 25th. Evidence, hole in stem and frass.

humuli Bird.—In stem of Hops often as high as 20 feet from base. Occupies a cigar-shaped gall which serves as evidence. Pupates in ground about July 20.

impecuniosa Grote.—In stem of *Aster umbellatus.* Pupates in stem about August 20th and is usually tightly wedged in burrow. Evidence, frass. Also feeds in Sneezeweed.

imperspicua Bird.—Life history unknown. Habitat, Franconia, New Hampshire, and Buffalo, New York.

inquaesita G. & R.—In sensitive fern (*Onoclea sensibilis*). Enters frond stem and bores to end of advancing root stock. Pupates in ground about August 1st. Evidence, orange-colored frass and during June the withered leaf.

insulidens Bird.—Life history unknown. Habitat, Vancouver Island.

limata Bird.—Life history unknown. Habitat, Pullman, Washington.

limpida Gr.—Lower stem and root of Burdock at Montreal, Quebec. Pupates in burrow or ground about July 15th. As burdock is not native in America this species must have some other indigenous food-plant. Type was from Illinois.

lysimachiae Bird.—In stem of loose-strife (*Lysimachia quadrifolia*). Pupates in the ground, August 12th to August 18th. Evidence, brown leaves and stem.

marginidens Gn.—In stem and root of *Cicuta maculata,* also *Rumex* and Cosmos and Burdock. Pupates in ground about July 20th. Evidence, fallen top or branch and frass at base. In burdock only frass.

maritima Bird.—In base of stalk of *Helianthus giganteus.* Pupates in burrow about August 15th. Evidence, large gall-like swelling at base and frass. Habitat, Atlantic coast of New York and New Jersey.

merriccata Bird.—In root of Mandrake or May Apple. Pupates in ground about August 10th. Evidence, yellow leaf and frass.

necopina Grote.—In base of stalk of *Helianthus tuberosus* and *H. rigidus.* Pupates in burrow or ground about August 1st. Evidence, swelling at base of stem and frass.

nelita Strecker and var. **linda** Bird.—In lower stem and root of *Rudbeckia laciniata.* Pupates in ground July 15th to August 10th. Evidence, frass.

nepheleptena Dyar.—In stem and root of Turtle-head or Snake-head (*Chelone glabra*). Pupates in ground about August 15. Evidence, white frass.

nephrasyntheta Dyar.—In root of *Eryngium yuccifolium.* Pupates in burrow or soil about August 15th. Evidence, yellow leaf blades and much brown frass.

nitela Gn. and var. **nebris** Gn.—The commonest of all. Feeds in stems of Ragweed (*Ambrosia trifida*) and over-runs into Burdock, corn and other plants. Pupates in stem about August 10th. Evidence, frass and holes in stem.

ochroptena Dyar.—Life history unknown. Habitat, Denver, Colorado.

pterisii Bird.—In stem and root of common Brake Fern (*Pteris aquilina*). Pupates in ground July 20th to July 30th. Evidence, yellow leaf and orange colored frass.

purpurifascia G. & R.—In root of Columbine (*Aquilegia canadensis*). Pupates in ground July 15th to August 15th. Evidence, frass.

rigida Grote.—In root of *Heliopsis helianthoides,* also in *Helianthus decapitalis* and *Zizia* sp. Pupates in ground about August 5th. Evidence, frass.

rubiginosa Bird.—In stem and root of *Heracleum lanatum* and *Angelica atropurpurea.* Pupates in ground July 20th to August 5th. Evidence, frass.

rutila Gn.—Life history unknown. Habitat, Illinois.

sciata Bird.—In root of Speedwell (*Veronica virginica*). Pupates in ground about August 15th. Evidence, frass and sometimes dry or broken stalk.

silphii Bird.—In root of *Silphium terebinthinaceum, S. laciniatum* and *S. perfoliatum.* Pupates in ground about August 10th.

speciosissima G. & R.—In root of Regal and Cinnamon ferns (*Osmunda regalis* and *cinnamomea.*) Pupates in ground about August 1st. Evidence, slight, sometimes a dry leaf, usually only frass and this a rusty-brown mud-like deposit.

stenocelis Dyar.—In root of fern (*Woodwardia virginica*). Pupates in ground about August 10th. Evidence, frass.

unimoda Smith.—Life history unknown. Habitat, Colorado.

verona Smith.—Life history unknown. Habitat, Winnipeg, Manitoba.

Some instruction as to the necessary equipment and the proper method of handling the larvae is essential. A strong jack knife, a garden trowel (the writer uses a steel intrenching tool, such as were carried by our soldiers in Cuba) and a botanical collecting case or, in place of this, an ordinary grip, are indispensable. A number of small vials or test tubes of ¼ inch diameter and about 2 inches long are very useful. These tubes should be corked and numbered for identification. They

will serve each for one larva, if it should leave its burrow when disturbed. To induce it to return to the burrow is a waste of time. Then, too, if it is desired to transfer a larva to a fresh food plant, the tube with the larva in it can be placed over the end of the fresh plant and the larva is thus forced to feed there, instead of exhausting itself by wandering around in search of its former home or some other plant more to its liking.

In general it is advisable to gather the larvae as late as possible before pupation takes place. Some species, however, are more easily detected in the earlier stages, and these have been noted in the list; such can be located early and taken in later. The time for taking them in is also limited so, as soon as July sets in and even before, it behooves the collector to "get busy." Care must be taken to keep the various food plants in separate boxes and specimens should be labeled with the name of the plant in which it is bred. A goodly number of boxes is therefore needed and they should be deep enough to contain 4 inches or more of loose soil or leaf mould and still leave about 6 inches clear above the soil.

It is best to take some root with the food plant whenever possible. It is also advisable to cover the soil with sphagnum moss (which can be obtained from any florist) to prevent its drying out as much as possible. The soil should be kept moist but never very wet. If the plant in which the larva was found is frail, it is best to supply a new plant at once. When the larva pupates in its burrow and the plant begins to dry and shrivel so as to pinch the pupa, the latter should be removed and placed on the soil and covered with moss.

These moths when mounted, usually become greasy, to prevent which, we break off the abdomens after the specimens are completely dry (not merely rigid), whether they show signs of grease or not, and immerse them in pure gasoline or benzine for one week, replacing them with the aid of Lepage's glue. Needless to say that the bodies must not be mixed. Small vaseline jars or jelly glasses are handy to use for the gasoline. Four to six bodies of different colors or sex can be placed in each at one time and the gasoline used only once. While in

use these jars should be kept in a dark place to prevent fading of colors.

As an indication of what may be done in the group, I need only state that in two seasons, the writer, with Mr. Emil Beer, of Chicago, who co-operated throughout, successfully reared to maturity 19 of the species listed above, all from the immediate vicinity of Chicago.

In conclusion I wish to acknowledge my indebtedness to Mr. Otto Buchholz of Elizabeth, New Jersey, who first supplied me with a list somewhat similar to that here given, and also to Mr. Henry Bird, who supplemented the efforts of Mr. Buchholz with valuable suggestions.

Tribolium confusum Duval as a Museum Pest (Col.).

During the late summer and fall of 1914, a sack of bran which had been partly used in grasshopper poisoning became the breeding place for the small flour beetle, *Tribolium confusum* Duval. From this bran, which hung in the attic, the beetles became generally diffused throughout the laboratory, finding their way into the temporary insect boxes. Aside from being a menace to the collections by crawling about in the boxes knocking off legs, antennae, wings, etc., and small specimens off points, they made further depredations by actually eating specimens. Many smaller insects were eaten in the boxes, which work was, no doubt, that of this insect and at one time the writer discovered five of the adults within a cavity in the abdomen of a moth eating vigorously.

This insect was found breeding in boxes of stored unpinned Lepidoptera by Mr. Wm. B. Turner, of this Station. Many larvae were present, some inside the bodies of the moths, others about on the bottom of box and in crevices. That they had been feeding was quite evident from the fragmentary matter sifted down to the bottom of the box. Pupae and newly emerged adults were present also. (Mar., 1915).—H. L. Parker, Bureau of Entomology, Division of Cereal and Forage Crop Insect Investigations, Hagerstown, Md.

Eleodes tricostatus Say in Missouri (Col.).

Blaisdell in his Revision of the Eleodiini (U. S. Nat. Mus. Bul. 63, '09) writing of this species mentions having no records of specimens from Missouri, Arkansas, Minnesota or Louisiana. Stoner (Ent. News, xxiv, 81) has recorded this species from about Fergus Falls, Minnesota, where I have also taken it in considerable numbers. Within the last three years' collecting in Missouri, I found it not rare at most points in the Ozark region.—M. P. Somes, Mountain Grove, Missouri.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., MAY, 1916.

The Biologia Centrali-Americana.

Elsewhere in this number we notice and quote from the final volume of one of the most extensive single works on natural history yet attempted—the *Biologia Centrali-Americana*.. Not the least remarkable and noteworthy feature connected with its completion is that its senior projector and editor has the happiness of beholding the accomplished deed. Many a similar work has failed, or been left in an unfinished state, owing to the death of its author, but to Dr. Frederick Ducane Godman Fate has been more kind and we can at present recall only Sir John Murray as having been equally fortunate in a somewhat comparable undertaking.

The *Biologia* affects us of the New World more than it does the nation to which its editors and most of their collaborators belong. Although the Rio Grande and the Gila form the northern boundary of the territory to which the *Biologia* is devoted, many of the plants and the animals with which it deals wander far to the north of those rivers just as on the south they extend far beyond the peaks of Darien. The Pan-American scope of science is more assured than Pan-American policies and from the very situation of the area to which the *Biologia* refers, this great work must always hold a most important and authoritative position.

We speak of the completion of the *Biologia,* yet Dr. Godman himself reminds us that various groups were unavoidably left untouched and that additional material came in from the collectors too late to be included in the appropriate volumes. The fauna and flora of Mexico and Central America is still imperfectly known, as the exploration of the lepidopterous fauna of Costa Rica by Messrs. Schaus and Barnes has recently very clearly demonstrated. The discoveries which the future has in store make it improbable that another *Biologia Centrali-Americana* of equal scope will ever be, and

the magnificent undertaking to which Messrs. Godman and Salvin have devoted their lives and their fortunes is likely to remain an incomparable monument in the study of Central American nature.

To Dr. Godman then, and to his assiduous secretary, Mr. G. C. Champion, go our hearty congratulations on the termination of the *Biologia!*

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Rearing of Winthemia quadripustulata from Rhynchophorous Larva (Dip., Col.).

On December 5, 1914, while following the plow in a sod field near Hagerstown, Maryland, several larvae, undoubtedly belonging to the group Rhynchophora were found. These larvae were brought into the laboratory and placed in a tin box with dirt. On December 15th it was observed that some of the larvae were dead and two Dipterous pupae had made their appearance in the box. One pupa was attached to the remains of a grub. The pupae were removed to separate boxes in which the adults emerged on January 7, 1915. The adults were determined by Mr. W. R. Walton as *Winthemia quadripustulata*. Concerning the individual larva from which the fly was reared, Dr. Böving, of the National Museum, says:

"The larva looks to me as a *Curculionid*. Mr. Craighead thinks the same..... I am confident that it is no *Cerambycid* nor *Bostrychiid*."

The mid-winter activity of the parasites was probably due to the fact that they were brought into the laboratory which was well heated.—H. L. Parker, Bureau of Entomology, Division of Cereal and Forage Crop Insect Investigations, Hagerstown, Md.

A Tachinid Parasite Reared from an Adult Capsid (Dip., Hom.).

On June 26, 1915, three adults of *Miris dolobrata* Linn., were placed in a small vial which was plugged with cotton. The next morning a live dipterous maggot about 7 mm. in length was found in the vial. One of the Capsids was examined and a large hole was found in the center of the abdomen. The maggot was placed on some finely sifted earth in a small flower pot and it immediately burrowed beneath the surface. On July 11 the adult had emerged and was found alive in the cage. This was determined by Dr. A. O. Johannsen as *Phorantha occidentis* Walker. According to Aldrich (Ann. Ent. Soc. Am. 8: 81, 1915) this species was reared by F. B. Milliken from *Nysius angustatus* Uhler. To my knowledge no dipterous parasites of the Capsidae have heretofore been recorded.—M. D. Leonard, Ithaca, New York.

Homophoeta lustrans Crotch in Iowa (Coleop.).

During October, 1915, a single specimen of this beetle was taken in a sweep net at Hills, near the southeastern part of the State. The collecting was done along and near the Iowa river on various weeds,

though I am unable to state the plant on which this particular individual was found. Up to this time *Homophoeta lustrans* Crotch has not been recorded from Iowa, it being a more southern species. Horn, in "A Synopsis of the Halticini of Bereal America" (Trans. Am. Ent. Soc. xvi, 1889), says of it: "Occurs in Texas." This Iowa record will bring the distribution much further north than before. There seems to be no doubt as to the identification, for the specimen agrees perfectly with those in the collection of H. F. Wickham.—L. L. Buchanan, Iowa City, Iowa.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

Unless mentioned in the title, the number of new species or forms are given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London.

For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **10**—Nature, London. **13**—Comptes Rendus, Societe de Biologie, Paris. **14**—Proceedings, The Zoological Society of London. **34**—Proceedings, Iowa Academy of Sciences, Des Moines. **40**—Societas Entomologica, Zurich. **46**—Tijdschrift voor Entomologie. **68**—Science, New York. **87**—Bulletin, Societe Entomologique de France, Paris. **142**—Report, Michigan Academy of Sciences, Lansing. **161**—Proceedings, The Biological Society of Washington. **166**—Internationale Entomologische Zeitschrift, Guben. **184**—Journal of Experimental Zoology, Philadelphia. **186**—Journal of Economic Biology, London. **189**—Journal of Entomology and Zoology, Claremont, Calif. **195**—Bulletin, Museum of Comparative Zoology, Cambridge. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **216**—Entomologische Zeitschrift, Frankfurt a. Main. **278**—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. **285**—Nature Study Review, Ithaca, N. Y. **322**—Journal of Morphology, Philadelphia. **324**—Journal of Animal Behavior, Cambridge. **344**—U. S. Department of Agriculture, Washington, D. C. **359**—Connecticut Agricultural Experiment Station, New Haven. **410**—Journal, Washington Academy of Sciences. **447**—Journal of Agricul-

tural Research, Washington. **469**—Annual Report and Transactions, Manchester Microscopical Society. **477**—The American Journal of Tropical Diseases and Preventive Medicine, New Orleans. **507**—Occasional Papers, Museum of Zoology, University of Michigan. **523**—Bolletino delle sedute della Accademia Gioenia di Scienze Naturali in Catania. **524**—Technical Bulletins, Entomology, University of California, Berkeley. **525**—Meddelanden fran Statens Skogsforsoksanstalt, Stockholm. **526**—Ectoparasites, ed. by Jordan & Rothschild, London. **527**—New York College of Forestry at Syracuse University.

GENERAL SUBJECT. Cook, O. F.—Determining types of genera, **410,** vi, 137-40. **Pierce, W. D.**—A new interpretation of the relationship of temperature and humidity to insect development, **447,** v, 1183-91. **Mottram, J. C.**—Some observations on pattern-blending with reference to obliterative shading and concealment of outline, **14,** 1915, 679-92.

PHYSIOLOGY AND EMBRYOLOGY. Browne, E. N.—A comparative study of the chromosomes of six species of Notonecta, **322,** xxvii, 119-47. **Hegner, R. W.**—Experimental studies on the relation between the structure and development of the eggs of chrysomelid beetles, **142,** xvi, 49-54. **Lewis & Robertson.**—The mitochondria and other structures observed by the tissue culture method in the male germ cells of Chorthippus curtipennis, **198,** xxx, 99-124. **Shull, A. F.**—Parthenogenesis in Anthothrips verbasci, **142,** xvi, 46-48.

MEDICAL. King, W. V.—Anopheles punctipennis, a host of tertian malaria, **477,** iii, 426-32.

ARACHNIDA, ETC. Andre, E.—Anomalie de l'appareil buccal d'Ascaris megalocephala, **278,** xxiv, 251-3. **Francaviglia, C.**—(See under Hemiptera). **Hilton, W. A.**—Mites from the Claremont Laguna region, **189,** viii, 35-6. **Hirst, S.**—On the "Harvest bug" (Microtrombidium autumnalis), **186,** x, 73-7. **Turner, C. H.**—Notes on the feeding behavior and oviposition of a captive American fake spider (Eremobates formicaria), **324,** vi, 160-8. **Willis, H. G.**—Spiders [Notes on], **469,** 1914, 50-9.

Banks, N.—Revision of Cayuga Lake Spiders, **1,** 1916, 68-84. New Californian mites [5 n. sps.], **189,** viii, 12-15. **Chamberlin, R. V.**—Results of the Yale Peruvian expedition of 1911. The Arachnida, **195,** lx, 177-299.

NEUROPTERA, ETC. Legendre, J.—Sur un nouveau mode d'elevage de Pediculus vestimenti, **13,** lxxix, 203-4. **Snyder, Tho. E.**—Termites, or "white ants," in the U. S.: their damage and methods of prevention, **344,** Bul. 333.

ORTHOPTERA. Francaviglia, C. (See under Hemiptera).

HEMIPTERA. Stoner, D.—Notes on Iowa Pentatomoidea, **34,** xxii, 347-54. **Baker, A. C.**—Identity of Eriosoma pyri, **447,** v, 1115-1119. **Francaviglia, C.**—Emitteri ed Ortotteri parassiti dell'orecchio umano; Acari parasiti dell'orecchio umano, **523,** 1915, 14-20; 21-27. **Lundbeck, W.**—Some remarks on the eggs and egg deposition of Halobates, 13 pp. (Mindeskrift for J. Steenstrup, xxvii, Kobenhavn).

Van Duzee, E. P.—Review of the genus Macrotylus [4 n. sps.], **189,** viii, 5-11. Synoptical keys to the genera of the No. American Miridae [5 n. g.; 3 n. n.]. New or little known genera and species of Orthotylini [2 n. g.; 5 n. sps.], **524,** i, 199-216; 217-227.

LEPIDOPTERA. Dolley, W. L., Jr.—Reactions to light in Vanessa antiopa, with special reference to circus movements, **184,** xx, 356-420. **Ebner, A.**—Interessante Catocalenzucht, **166,** ix, 131-2. **Mallonee, A. M.**—Frogs catching butterflies, **68,** xliii, 386-87. **Shufeldt, R. W.**—Nature-study and the common forms of animal life.—V. [Insects], **285,** xii, 115-24. **Tragardh, A. I.**—Bidrag till kannedomen om tallens ach granens fiender bland smafjarilarna, **525,** 1915, 813-874.

Fruhstorfer, H.—Eine neue neotropische Nymphalide, **40,** xxxi, 14. Neue neotropische Nymphalide, **216,** xxix, 97-98.

DIPTERA. Buttrick, P. L.—A mosquito survey at the mouth of the Connecticut river, **359,** Bul. 189. **Garnett, H.**—A note on Simulium, **469,** 1914, 37-40. **Jobbins-Pomeroy, A. W.**—Notes on five N. Am. buffalo gnats of the genus Simulium, **344,** No. 329.

Malloch, J. R.—The generic status of Chrysanthrax Osten Sacken, **161,** xxix, 63-70. **Jordan & Rothschild.**—Contribution to our knowledge of American Siphonaptera [2 n. g.; 5 n. sps.], **526,** i, 45-60. **Rothschild, N. C.**—Further notes on Siphonaptera fracticipita, with descriptions of new gen. and sps. [1 new sp.]. On Neopsylla and some allied genera of Siphonaptera [2 n. gen.; 6 n. sps.], **526,** i, 25-29; 30-44.

COLEOPTERA. Andrews, E. A.—Color changes in the rhinocerus beetle, Dynastes tityrus, **184,** xx, 435-56. **Blackman, M. W.**—Observations on the life history and habits of Pityogenes hopkinsi Swaine, **527,** Tech. Pub. No. 2, 11-66. **Du Porte, E. M.**—Death feigning reactions in Tychius picirostris, **324,** vi, 138-49.

Grouvelle, A.—Descriptions de deux Telephanus de la Jamaique, **87,** 1916, 84-7. **Swaine, J. M.**—A new species of Pityogenes, **527,** Tech. Pub. No. 2, 8-10.

HYMENOPTERA. Brun, R.—Le probleme de l'orientation lointaine chez les fourmis, **278**, xxiv, 355-88. **F.**—The recent mortality among bees, **10**, xcvii, 7-8. **Wasmann, E.**—Nachtrag zu "Eine neue Pseudomyrma aus der Ochsenhorndornakazie in Mexiko," **46**, lviii, 125-131.

Cockerell, T. D. A.—Bees from the northern peninsula of Michigan [2 new]; Some bees from British Guiana, **507**, No. 23; 24. **Wheeler, W. M.**—Ants collected in Trinidad by Roland Thaxter, F. W. Urich and others, **195**, lx, 323-30.

OBITUARY.

The death of THEODORE PERGANDE on March 23, 1916, in Washington, is announced in *Science* for April 7. He was born in Germany seventy-six years ago, came to America at the outbreak of the Civil War and served in the Federal Army. He became assistant to Prof. C. V. Riley, then State Entomologist of Missouri, and accompanied the latter to Washington in June, 1878, so that he was the oldest scientific assistant, in point of continued service, in the Bureau of Entomology at the time of his death. Among his published writings are: *Habits of Thrips* (Psyche 1882 [1883]), *The Cotton or Melon Plant Louse* and *Observations on Certain Thripidae* (Insect Life, 1895), *The Plum Plant Louse* (Bulletin No. 7, Div. Ent., U. S. Dept. Agr., 1897), *A New Coccid on Birch* (with H. G. Hubbard) and *The Peach Lecanium* (Bulletin 18, 1898), *List of Coccidae Collected by Mr. A. Busck in Puerto Rico,* 1899 (with T. D. A. Cockerell) (Bull. 22, 1900), *The Life History of Two Species of Plant Lice Inhabiting both the Witch Hazel and Birch* (Bull. 9, Tech. Series, 1901), *The Southern Grain Louse, Toxoptera graminum* (Bull. 38, 1902), *On Some of the Aphides Affecting Grains and Grasses of the United States* (Bull. 44, 1904) and *North American Phylloxerinae Affecting Hicoria (Carya) and Other Trees* (Proceedings Davenport Acad. Sci., 1904). To the NEWS he contributed a *Description of a New Species of Idolothrips* (1896), *Description of Two New Genera and Three New Species of Aphididae* (1906), and a rhymed effusion, *A Happy Family of Bugologists* (1908).

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

Wanted—A person in the vicinity of New York City who can spread butterflies skilfully.—W. Tonnclé, 200 W. 72d St., New York City.

Carabidae of genera *Omophron*, *Nomaretus*, and especially *Elaphrus* wanted for cash. Specimens other than those from N. E. States more desired.—Alan S. Nicolay, 416a Grand Ave., Brooklyn, New York.

Liberal exchange given for Lepidoptera needed for the collection of the American Entomological Society, 1900 Race St., Phila., Pa.

For Exchange—Insect Life, Vol. I, Nos. 4, 5, 6; Vol. II, Nos. 7, 8, 9, 10; Vol. III, Nos. 4, 5, 9, 10; Vol. 7, bound; U. S. Bur. Ent. Bull. (N. S.), Nos. 31, 44. Wanted 5th Ill. Report, and Riley's 9th Mo. Report.—E. G. Kelly, Wellington, Kansas.

Lepidoptera—I have for exchange Eastern U. S. Noctuidae and Geometridae mounted on pins, including *Catocala elonympha*, *similis*, *praeclara*, *gracilis*, *coccinata*, *epione*, *relicta* and varieties. Also cocoons of *P. cynthia* and *C. angulifera*.—John H. West, 2057 East York Street, Phila., Pa.

Wanted for cash—Lucanidae in perfect condition.—Joseph Brunner, Missoula, Montana.

For exchange—Entomological News, 1909, 1910, 1911, also Zeitschrift für wissenschaftliche Insecten Biologie, 1910, 1911, 1912.—Henry Wormsbacher, 1357 St. Charles Ave., Lakewood, Ohio.

Wanted—12 pair of *Argynnis idalia*, 3 pair *Arg. diana*, 2 pair *Arg. edwardsii* for exchange or cash.—A. F. Porter, Decorah, Iowa.

Wanted—Will pay cash for fertile females of the genus *Eubaphe* or give other Lepidoptera in exchange. Specimens from west and northwest especially desired. Write for details.—Alex. Kwiat, 2445 Eastwood Ave., Chicago, Ill.

Orthoptera—Especially from the mid-west examined for collectors. Correspondence invited.—M. P. Somes, Box 226, Mountain Grove, Mo.

Wanted for Cash or will give liberal exchange for Cetonidae of North, South and Central America. Send in your list.—Frank J. Psota, 316 So. Mozart St., Chicago, Ill.

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